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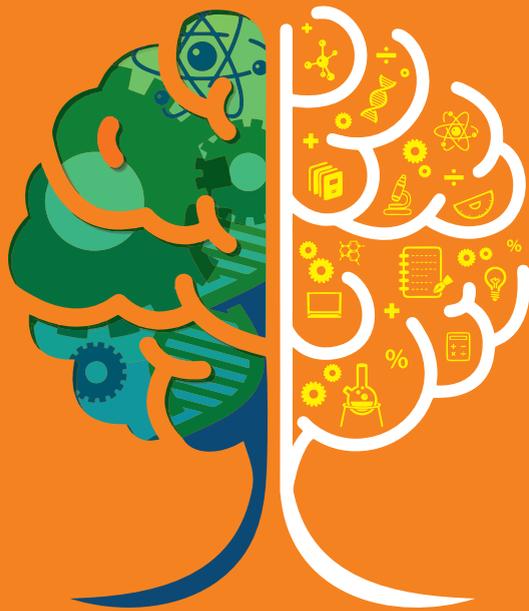
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COST CONCERNS



Milind Kokje
Chief Editor
milind.kokje@mmactiv.com

Cost appears to be the major concern across the world, including Asia, when it comes to drugs. The US President Donald Trump recently expressed concern over the prices of prescription drugs going “out of control”. His statement in the cabinet meeting resulted in stocks of pharma companies dropping slightly.

The concerns are similar and equally deep and serious in the Asian region too. A recent Business Monitor International’s report ‘Pharma and Healthcare Insight, Asia – Industry Trend Analysis’ also touches the subject of drug prices and their affordability in the Asian region. “Governments across the Asia Pacific (APAC) region will face challenges in ensuring the population’s access to medicines in a cost effective manner,” the report says.

The demand and consumption of drugs is rapidly rising in the APAC region. Aging population and growing burden of chronic diseases are fueling the growth in demand. Pharmaceutical market of APAC was about \$ 304 billion the previous year. It is expected to grow to \$ 375 billion by 2021 with 6% CAGR. While various research reports published in the near past are forecasting rapid growth in the pharma market in APAC region, they also have expressed growing concerns of the respective governments over the rising healthcare cost caused in one way by high drug prices and the measures announced or taken by them to meet the challenge to make treatments affordable to the people.

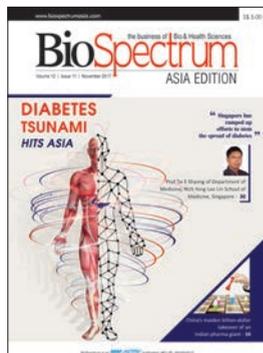
However, according to one study in US, prescription medicines including retail pharmacy sales are only 14% of the overall healthcare spending and hospitals comprise the largest share of about 30%. Physicians and clinical services are about 20%. However, no matter how low may be the percentage of prescription medicines and pharmacy sales in overall healthcare expenditure, when it actually comes to paying the price of drugs by individual patients that low percentage does not matter and what counts is the actual price of the drug and if it is high it becomes unaffordable to many.

In order to overcome this problem increasingly aggressive pricing controls have been implemented by the authorities. They include value based pricing, annual price revision and capping of medicine prices. This has been pointed out by the industry trend report quoting examples from Japan where almost half price reduction is introduced in case of a drug. Japan has also proposed creating a more structured cost-effectiveness assessment scheme. In China, price reduction of some drugs is reimbursed to the drug company from national health insurance.

Another report by E & Y has mentioned that Indonesia is allowing import of lower-priced copies of patented products, while Malaysia is adopting measures to control the rise in healthcare costs. A consumers’ association in Malaysia has urged the government to introduce national drug pricing control system. Along with the price control by authorities, one more solution being considered by them to reduce the prices is promoting generic drugs and biosimilars. In its report, Frost & Sullivan expects the pricing environment in APAC to become more dynamic, which would drive generics and biosimilar market as substitution to expensive products.

BMI’s industry trend report has mentioned that Malaysia is trying to increase the use of generics and biosimilars. Australia has stated to promote lower value generic medicines to reduce pharma expenditure. Japan unveiled its plan of boosting use of generic drugs from 56% to 80% by 2020. The Philippines FDA has supported the formation of a committee on generic drugs development to encourage investment in generic drug production with higher quality and more affordability.

Thus, affordability of the drugs is going to be the main focus of the governments to provide relief to the citizens. For that, the measures adopted by the governments will be forceful pricing pressure and focus on generic substitution in addition to boosting domestic drug production, the report has predicted. This, of course, will pose a challenge to the pharma companies, particularly the multinationals.



Diabetes management

The cover story on diabetes was very riveting. This disease is definitely growing at a very fast pace. A holistic approach is what we need to manage and control this condition.

- **Revathy Iyer**, Chennai

Technological growth

Growth of wearable devices is surely on a rise within Asian countries. But a robust infrastructure can further help in developing better healthcare delivery models.

- **Keerthi Vasudev**, Singapore

Medicine is advancing

It is good to know that Asia would soon be considered the second largest medtech market. The advancing medical field has a lot of potential and would go a long way.

- **Shery Topa**, Japan

Burden of diabetes

Thank you for sharing such an engaging article on diabetes. Health officials should be paying equal attention to both communicable and non-communicable diseases.

- **Ranjan Kumar**, New Delhi

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REGULATORY NEWS

Pakistan receives funds for eradicating polio

The Government of Japan recently announced a grant provision of 520 million Yen to support the supply of essential polio vaccines during the 2017-2018 in Islamabad. The grant notes were signed and exchanged between the Government of Japan, Japan International Cooperation Agency (JICA) and the United Nations Children's Fund (UNICEF).

The grant is worth \$4.63



million that will support the procurement of over 28 million doses of Oral Polio Vaccine (OPV).

It will be sufficient to vaccinate 25 million children under the age of five in the high-risk districts across Pakistan, enabling the program to quickly close the immunity gaps.

Prime Minister's Focal Person for Polio Eradication, Senator Ayesha Raza Farooq has pointed out that Pakistan's programme is rated among one of the best public health service delivery initiatives across the globe.



Hospitals team up for providing holistic care in Singapore

Tan Tock Seng Hospital (TTSH) and Khoo Teck Puat Hospital (KTPH) have joined hands to set up a regional cluster in order to provide a more comprehensive healthcare service to the people of Singapore. Professor Philip Choo will be head of the new regional cluster, the first of three to be officially set up. The move is part of a nationwide re-organisation of public healthcare services into three regional clusters, each with at least two acute hospitals, a medical school, several polyclinics as well as other facilities such as specialist centres and community hospitals.

Patients at TTSH are older and the challenge for the hospital is to keep them fit so they do not return with the same problem. KTPH, on the other hand, has a younger population in its catchment and its focus has been to go out to the residents offering health screening and other programmes.

Government funding is expected to change to mirror a more holistic approach. It will be in the interest of clusters to invest in preventive and rehabilitative care, to keep people healthy and out of hospitals, which is the most expensive component in the healthcare system.

Japan signs health agreement with Denmark

The health minister at Denmark, Ellen Trane Nørby, has recently signed an agreement with the Japanese deputy minister for health, work and welfare, Mizhho Onuma, on her visit to Tokyo.

The agreement will pave the way for increased co-operation between the two countries in the health sphere and lead to regular meetings so that expertise and experience can be exchanged.

According to the Foreign Ministry, the forthcoming free trade agreement between the EU and Japan will also increase Danish exports by up to 70 per cent. Japan is the world's second-largest market for medicines, and these topped the list of Danish exports to Japan in 2016. The Japanese market for health-related products is expected to have grown by 50 per cent by 2025.





S3 launches programme for stroke survivors

A brain health and memory training programme is being rolled out by a charity organisation called Stroke Support Station (S3). It will be the first such programme in Singapore that is launched in the community. So far, about 20 stroke survivors have been put on the brain health programme at the Enabling Village in Lengkok Bahru. The programme has been designed by Dr Catherine Dong, a visiting neuropsychologist at the National University Hospital Memory Clinic. The participants also attend health education classes with caregivers to learn about post-stroke cognitive changes and advance care planning options. The participants will be taught various strategies to help improve their memory, reduce their stress or cope with post-stroke fatigue. It is helpful to have a community-based programme as some survivors' mental-related problems surface after they are discharged from hospital. Each three-hour session costs \$30, but those with the Community Health Assist Scheme card pay just \$6 for each session.



Taiwan signs agreement with Marshall Islands for healthcare

Taipei Medical University Shuang Ho Hospital at Taiwan has signed an agreement with the Marshall Islands' Ministry of Health and Human Services to continue a medical internship programme as well as establish a Hospital Information System (HIS) to enhance the quality of health care in the Pacific Island country.

The signing of agreement was attended by Taiwan President Tsai Ing-wen and Hilda Heine, President of the Marshall Islands. According to the agreement, Shuang Ho Hospital will help with

the running of a clinical internship program for medical interns in the Marshall Islands as well as set up a HIS at Majuro Hospital, which is located in the country's capital city Majuro, to digitize patient records and other medical information.

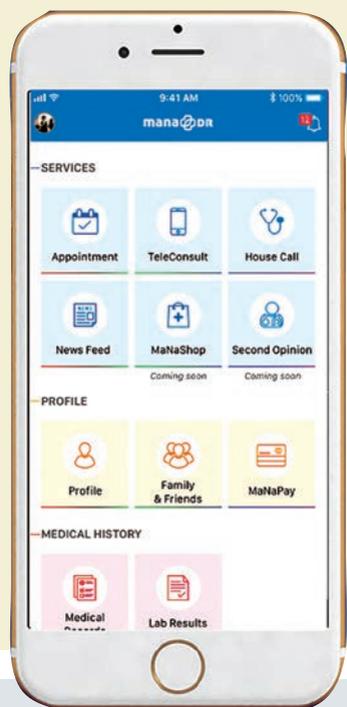
Taiwan's health care efforts in the Marshall Islands includes helping local hospitals set up a standard operating procedure (SOP) for patient care and donating a picture archiving and communication system (PACS), commonly used in radiology to store diagnostic information.

China approves domestic Ebola vaccine

The military-backed Bioengineering Institute of the Chinese Academy of Military Medical Sciences and private drug maker Cansino Biologics Inc., of Tianjin have co-developed a vaccine for the deadly Ebola virus. After getting approval from CFDA, China is now the third country in the world, after the US and Russia, with an approved vaccine. The vaccine, named recombinant Ebola virus disease vaccine (Adenovirus type 5 vector), is a recombinant replication defective human Ad5 vector-based vaccine expressing Ebola virus glycoprotein, which can stimulate immunity against the Ebola virus in both human cells and bodily fluids. CFDA has highlighted in the announcement that the newly approved vaccine is superior to the currently available vaccines in terms of the stability. The vaccine is based on the 2014 mutant gene type and in the form of freeze-dried powder, which can remain stable for at least two weeks in temperatures of up to 37 degrees Celsius.

Singapore offers a new tele-consult app for patients

A new app has been recently launched in Singapore that allows patients to book appointments with doctors, and have round-the-clock tele-consultation with them. Since the app was soft launched in January, close to 100,000 appointments have already been booked. The app is part of a larger healthcare platform, also called MaNaDr. It is owned by healthcare firm Mobile Health, which was set up by a group of doctors in Singapore. The app provides an extra stream of revenue for doctors through the paid tele-consults, though they do not have to pay a fee to put their services on the app. Patients can text doctors and send pictures of their medical condition through the app for the tele-consults, which are mostly used as follow-up consultations. If their preferred doctor is unavailable, they will be referred to another doctor through the app.



GSK opens new Asia headquarters in Singapore

GSK celebrated the official opening of GSK Asia House (GSKAH), the new commercial hub for more than half of its worldwide healthcare operations. The Singapore headquarters will house the senior regional leadership teams of the Pharmaceuticals, Vaccines and Consumer Healthcare businesses and will work alongside the US hub to support its Global Headquarters in the UK to manage commercial activities around the world.

Located at One-North in the Rochester Park area of Singapore, it will enable GSK to better anticipate and respond to diverse healthcare needs across different markets, placing GSK in a leading position to support patients and consumers. The inauguration ceremony was officiated by Tharman Shanmugaratnam, Singapore's Deputy Prime Minister and Coordinating Minister for Economic and Social Policies as the Guest-of-Honour together with Emma Walmsley, Chief Executive Officer of GSK Plc. A foundation for future growth in Asia and beyond GSKAH will serve as the global home for several key business areas, and will be the base for the pharmaceuticals business in the Emerging Markets and International regions, the Consumer Healthcare businesses in Asia Pacific, as well as the Global Classic & Established Products business.

Singapore grants patent to Suven for neuro molecule

Suven Life Sciences Ltd. has been granted a product patent from Singapore for the New Chemical Entities (NCEs) dealing with treatment of disorders associated with Neurodegenerative diseases. The patent is valid through 2033. The class of selective 5-HT₄ compounds are being developed as therapeutic agents for the treatment of cognitive impairment associated with neurodegenerative disorders like Alzheimer's disease, Attention deficient hyperactivity disorder (ADHD), Huntington's disease, Parkinson and Schizophrenia. Suven Life Science is focused on discovering, developing and commercializing novel pharmaceutical products, which are first in class for neurological therapies.



Biogen extends collaboration with Eisai

Eisai Co., Ltd. and Biogen Inc. have expanded their existing agreement to jointly develop and commercialize investigational Alzheimer's disease treatments. Under the terms of the agreement Eisai has exercised its option to co-develop and copromote aducanumab, Biogen's investigational anti-amyloid beta (A beta) antibody for patients with Alzheimer's disease (AD).

The expanded agreement leverages each company's respective geographic strengths for commercialization and adjusts the respective share of profits from potential sales of aducanumab. Biogen will receive 55 percent of the potential profits in the United States and 68.5 percent of the potential profits in Europe.

Eisai will receive 80 per cent of the potential profits in Japan and Asia (excluding China and South Korea). The companies will have a 50:50 co-promotion split of potential profits in the rest of the world. Further, Biogen will book sales in the United States, Europe, and rest of world markets while Eisai will book sales in Japan and Asia (excluding China, South Korea). Biogen will continue to lead the ongoing Phase 3 development of aducanumab and will remain solely responsible for all development costs for aducanumab until April 2018.



WuXi AppTec acquires US clinical research firm

In line with its expansion strategies, Shanghai based biotechnology and medical-device developer WuXi AppTec Group has acquired US-based clinical research company Research Point Global (RPG).

The acquisition will help expand WuXi's clinical research capabilities in the United States and around the world. The deal will combine Research Point with WuXi's existing China-based clinical development service team.

Upon completion of the acquisition, RPG will become a wholly owned subsidiary of WuXi, with

its service integrated with WuXi's existing China-based, 500-member clinical development service team, or a CRO in the traditional sense, plus 1,000 clinical research coordinators under its site management organization (SMO).

WuXi is in an acquisition spree and has kept up its pace of overseas investments, eyeing strategic acquisitions. Earlier this year, it formed an alliance with biopharmaceutical giant AbbVie Inc. and life-sciences startup Genomics Medicine Ireland Ltd. to conduct population genomics research.



Korea to get an AI healthcare system

Samsung Medical Center (SMC) is collaborating with Microsoft Korea to build a Korean artificial intelligence (AI) precision healthcare system using Azure, a cloud platform based on Microsoft's AI. The two companies have signed a memorandum of understanding (MoU) for analyzing medical data in the cloud, optimizing clinical decision making and establishing disease-specific prediction models. Microsoft Korea will provide the IT infrastructure for medical data processing and analysis, while SMC will promote three AI pilot research projects based on genome data, image data, and sleep data based on it. SMC has developed a medical research information platform that has been actively pursuing to build a medical AI infrastructure. Based on Microsoft's latest artificial intelligence algorithms and massive cloud infrastructures and using the big systematic data of SMC that includes medical care and health checkup information, the two companies have continuously developed AI models for disease-specific AI diagnosis, early detection of cancer disease and AI diagnosis technology.

FINANCE NEWS

Fosun to buy French drug distributor Tridem

China's Fosun Pharma recently announced the acquisition of French drug distributor, Tridem for up to 63 million euros (\$73.1 million). The Shanghai based drug firm announced the acquisition in a recent filing to the Hong Kong stock exchange. Tridem is the third-largest pharma distribution and promotion company in French-speaking Africa, with a sales network covering 21 countries and regions. Tridem's promising sales network will help Fosun tap the lucrative European continent. A subsidiary of China's Fosun Group, which is led by billionaire Guo Guangchang, Fosun is in an acquisition spree, aggressively expanding its network and sales across continents. Fosun Pharmaceutical will have the right to nominate at least four directors to sit on Tridem's board while the existing share holder Financière des Lices shall have the right to nominate one director. Earlier this month Fosun had acquired the Indian drug giant Gland Pharma for \$1.1 billion.



Poxel inks a deal with Sumitomo Dainippon Pharma

Japan based Sumitomo Dainippon Pharma is adding a phase III drug Imeglimin to its growing diabetes product pipeline in a deal covering nearly 12 Asian countries.

The company has inked a strategic deal with Poxel SA for the development and commercialization of Imeglimin, an investigational therapeutic agent for type 2 diabetes, in Japan, China, South Korea, Taiwan and nine other Southeast Asian countries.

The partnership enables Sumitomo Dainippon Pharma to add an innovative late-stage development product to its

well established diabetes drug franchise in the fast-growing diabetes market in Japan.

Imeglimin's developer, the French biopharma Poxel SA, will get an upfront payment of ¥4.75 billion (\$42 million), along with potential development milestone payments, sales-based payments and escalating double-digit royalties that could be worth up to ¥29.25 billion (\$257 million). Poxel also gains a leading pharmaceutical partner for Imeglimin with an extensive track record in late-stage development and commercialization in Asia.

China Biologic plans acquisition of TianXinFu

The fully integrated plasma based biopharmaceutical company China Biologic has agreed to acquire 80 per cent equity interest in Tianxinfu Medical Appliance Co. Ltd from PW Medtech (PWM) Group Limited.

TianXinFu, a medical device company primarily engaging in the manufacturing and sale of regenerative medical biomaterial products, is currently owned at 80 per cent by PWM and 20 per cent by a third party.

In exchange for its acquisition of 80 per cent equity



interest in TianXinFu from PWM, China Biologic will issue 5,521,000 ordinary shares to PWM. Upon the closing of the proposed transaction, PWM is expected to hold approximately 16.66 per cent of the outstanding share capital of China

Biologic taking into effect the new issuance. This acquisition will enable China Biologic to unlock the market potential of their new or upcoming high margin coagulation factor.



Singapore signs a deal to promote health startups in China

Singaporean government agency International Enterprise Singapore (IE) has signed two new Memoranda of Understanding (MoUs) with tech partners in China to help local startups tap into the Chinese market and the country's resources for innovation.

The agreements will see accelerator AIRmaker, Nanyang Technological University's enterprise branch NTUitive, and leading Chinese media platform 36Kr, work with IE Singapore to provide support for young tech companies in understanding the Chinese market, test-bedding products, and partnering with Chinese firms to roll out solutions.

The first stage of the programme will work with eight to ten startups on Artificial Intelligence solutions. NTUitive will be directly involved in the collaboration, integrating its research innovations to help the new businesses.

The accelerator will also provide resources such as co-working spaces, network contacts, support and training to help the companies' growth and expansion plans in Beijing and in other cities in China.

Prenetics plans expansion in Asian countries

Prenetics, a genetic testing startup, plans to expand into more Asian countries after raising a \$40 million Series B led by Beyond Ventures and Alibaba Hong Kong Entrepreneurs Fund. The round also includes capital from Yuntai Investment Partners, mFund and eGarden Ventures, and brings Prenetics' total raised so far to \$50 million. The capital will be spent on product development, hiring more engineers and scientists, mergers and acquisitions and expanding in China and Southeast Asia. Prenetics partners with insurance companies to provide genetic tests to policyholders and is currently available in Hong Kong, Singapore, Malaysia and Thailand, with more country launches planned as part of its expansion. It claims to have processed 200,000 DNA samples so far. Alibaba Hong Kong Entrepreneurs Fund was launched as a nonprofit in 2015 to support companies that can potentially contribute to Alibaba's ecosystem. While Alibaba is best known for e-commerce, the tech giant also runs a healthcare subsidiary called Alibaba Health Information Technology, known as Ali Health.

Bio Hub at Seoul to support health startups

The Seoul Metropolitan Government recently held a ceremony celebrating the opening of the first main building in the Seoul Bio Cluster, which houses collaboration offices to connect local biohealth startups with big industry players. The Seoul Bio Hub is a biotech control tower that supports everyone from early-stage entrepreneurs to companies preparing to go global.

The Bio Hub officially opened in Hongneung, Central Seoul, with Johnson & Johnson Innovation Partnering Office located within the facility. J&J Innovation plans to



discover and provide business and research partnership opportunities to South Korean startups specializing in biopharmaceuticals, medical devices and consumer health goods. The new partner office will house 10 startups selected by the city's program and two winning startups from the

Quick Fire Challenges competition co-hosted by J&J and the city of Seoul.

The city of Seoul plans to provide 500 working spaces for startups by 2023 and invest 15 billion won toward purchasing 99 types of laboratory equipment including microscopes and centrifuges by 2021. It will also form a 40 billion won fund to help promising biohealth startups in their early stages commercialize their technologies and products and invite more global healthcare startup accelerators to buttress Korea's biotech innovation.

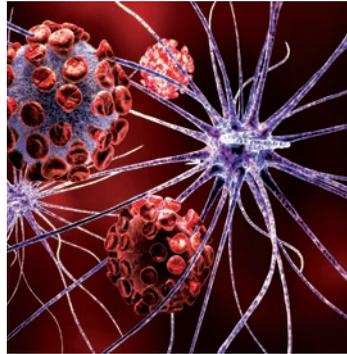
START-UP NEWS

Ontario startup joins hands with AbbVie

A start-up founded based on discoveries from three Ontario researchers, including one from McMaster University, has secured a major deal to develop cancer-fighting viruses. Turnstone Biologics' partnership with AbbVie gives the global biopharmaceutical company an exclusive option to license up to three of Turnstone's cancer-fighting viruses. Under the terms of the agreement, AbbVie has an option to obtain all global development and commercialization rights to Turnstone Biologics' Ad-MG1-MAGEA3 therapy, which is in two Phase 1/2 clinical trials for multiple solid tumor indications both alone and in combination with an approved anti-PD-1 checkpoint inhibitor, as well as up to two research-stage candidates to be developed by Turnstone as part of the collaboration. Turnstone Biologics has engineered its Maraba oncolytic viral immunotherapy to function as both a selective tumor-destroying oncolytic virus and an immune-stimulating T cell vaccine. Leaving healthy cells unaffected, the Maraba platform directly attacks cancer cells and changes the tumor microenvironment to make the cancer susceptible to the targeted vaccine-induced immune response. The result is a powerful therapy that harnesses the individual's own immune system to attack and kill tumors locally and at metastatic sites throughout the body, generating durable memory and preventing recurrence.

Korean biotech collaborates with Johns Hopkins startup

1ST Biotherapeutics, Inc. (1ST Bio), a private Korean biotech company, and Neuraly Inc., a startup from Johns Hopkins School of Medicine, have announced a collaboration to co-develop novel brain penetrant c-Abl inhibitors for Parkinson's disease. Recent research has shown that inhibitors to c-Abl could slow the progression of Parkinson's disease. Parkinson's disease, a chronic and progressive movement disorder, is the second most common neurodegenerative disease, affecting nearly one million people in the United States.



The goal of the collaboration between 1ST Biotherapeutics and Neuraly is to develop novel c-Abl inhibitor drugs that have desirable properties for CNS therapy such as optimal blood-brain barrier penetration and improved safety profile. We look forward to collaborating with the researchers

at Neuraly, who have performed important research into c-Abl's pathogenic role in the neurodegeneration seen in Parkinson's disease.

Under the terms of the collaboration, 1ST Biotherapeutics will perform the preclinical development, and Neuraly will test the drug candidates in various preclinical models of the disease. The goal is to file an Investigational New Drug application with the FDA next year. 1ST Biotherapeutics will retain all intellectual property generated in the collaboration.

Azura Ophthalmics raises \$20 M

Australian and Israeli-based biotech startup Azura Ophthalmics has raised \$20 million to fund treatments for meibomian gland dysfunction (MGD), a leading cause of dry eye disease. The meibomian gland produces a lipid that protects the eyeball with a thin film, and plays an integral role in vision quality. In post-menopausal women and people with autoimmune deficiency, however, the eye's surface can often deteriorate as individual ages, causing

discomfort and damage to the eye. The startup will use the \$20 million raised to conduct clinical trials in Australia for a pharmacological product that will treat MGD by repairing dysfunctional meibomian glands. The trial will be conducted with 120 MGD patients in collaboration with the University of New South Wales and the University of Melbourne, as Azura looks to get the product approved by the US Food and Drug Administration (FDA).



FDA provides new guidelines for medical devices

The US Food and Drug Administration (FDA) has finalised new guidelines to promote medical device innovation and provide patients with fast access to beneficial technologies.

The new steps include three new guidance documents to allow efficient and predictable development, along with establishing modern tools for measurement of device safety and performance. The organisation has completed the first qualification

of a medical device development tool (MDDT), which is a 23-item questionnaire designed to measure information such as health status and clinical symptoms reported by heart failure patients.

MDDT is intended to help in designing heart failure devices for accurate and efficient quantification of the device to ensure actual improvement in a patient's quality of life. The organisation recommends development of such medical

device tools, primarily for wearable technologies, to potentially avoid animal studies, minimise testing time and improve ability to analyse benefit and risk.

The first new draft guidance by the FDA is Breakthrough Devices Programme that offers quick access to certain devices that could effectively diagnose or treat life-threatening or irreversibly debilitating diseases or conditions. It has been developed by the 21st Century Cures Act.



TB Alliance announces phase 1 clinical trials of two novel tuberculosis drugs

TB Alliance recently announced that TBA-7371 and sutezolid entered phase 1 clinical trials. Both compounds have proceeded through early preclinical development and were granted "Investigative New Drug" status by the U.S. Food and Drug Administration. The phase 1 clinical trials are presently ongoing.

TBA-7371 is an antimicrobial compound developed by TB Alliance in collaboration with AstraZeneca. Sutezolid on the other hand belongs to a class of

drugs that has already shown evidence of clinical activity against TB but the associated toxicity can be problematic. In March 2017, TB Alliance and the Medicines Patent Pool announced a sublicensing agreement for the development and commercialization of sutezolid for the treatment of TB. There is still a long way to go before researchers arrive at a universal cure for this disease, but there are building blocks coming through the research pipeline that show us we can get there.

Novartis to acquire radiopharma for \$3.9B

Novartis has plans to buy France's Advanced Accelerator Applications (AAA) in a \$3.9 billion cash deal to strengthen the oncology portfolio at the world's biggest maker of prescription medicine. Novartis is seeking to add the company's radiopharmaceuticals that use trace amounts of radioactive compounds to not only create functional images of organs and lesions but also to treat diseases like cancer. AAA's flagship product, Lutathera, won European Union backing in late September for use against gastroenteropancreatic neuroendocrine tumours. Lutathera, which has also been submitted to the U.S. Food and Drug Administration for approval, harnesses a molecule not only to diagnose cancer but also to deliver treatment by hitting cancer cells with high-energy electrons. AAA was spun off from Europe's physics research centre CERN 15 years ago and has had sales of \$78 million in the first half of 2017, with a net loss from continuing operations of \$24.2 million.



WORLD NEWS



Health Ministry to focus on cancer diagnosis in Kenya

The Ministry of Health will institutionalise a technical working group with an oversight committee to oversee the planning of imaging services for cancer diagnosis in Kenya. A survey will be carried out for cancer diagnostic imaging capacity in Kenya.

A majority of Kenyans cannot access or afford medical imaging techniques as most facilities are in Nairobi. The ministry will also implement national guidelines for radiology diagnostic imaging and nuclear medicine imaging in accordance to International Atomic Energy Agency guidelines. Kenya lacks clinical guidelines for the use of the existing medical imaging equipment.

The WHO cites infrastructure as an important aspect in imaging services which includes trained medical, technical and engineering staff, radiation protection measures and regulations for optimisation of delivery of radiation doses delivered during CT and fluroscopy. The ministry is seeking to improve and strengthen cancer medical imaging infrastructure.

Canada to support children health in Nigeria

The Canadian government has earmarked \$3.5 billion to advance the health of women and children in Nigeria. The High Commissioner, Dr Christopher Thorney, made the disclosure during the Multi-Country Dissemination of the Rapid Access Expansion (RACE) Project on Integrated Community Case Management of Childhood Illnesses (ICCM) in Abuja. Other collaborative efforts are being made in the areas of polio eradication and other Maternal Newborn Child Health (MNCH) through Canada's G8 initiative. The initiative on MNCH was followed by the 2015-2020 commitment to invest \$3.5bn in related programs over five years. According to the High Commissioner, statistics on maternal and child deaths globally are troubling in spite of tremendous efforts already made. Although most of the effective interventions for these diseases were known, simple and affordable, however, often inaccessible to families who could not reach health facilities on time, especially within the crucial 24 hours.

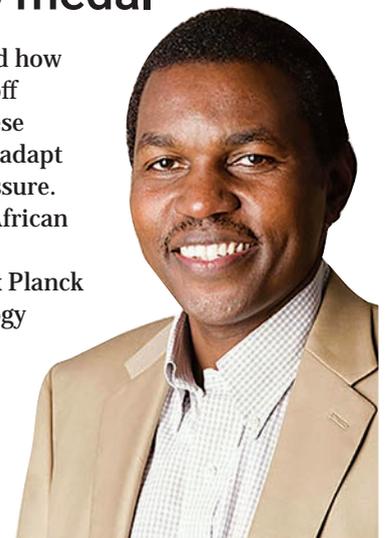
Durban based researcher gets SAMRC medal

Professor Thumbi Ndung'u has been awarded a gold medal by the South African Medical Research Council (SAMRC) for his contributions to HIV and tuberculosis research.

Ndung'u runs a laboratory at the Africa Health Research Institute (AHRI) and holds a professorship at The University of KwaZulu-Natal (UKZN). He was presented with the medal at the 2017 SAMRC Scientific Merit Awards gala dinner in Cape Town recently.

Ndung'u's research focuses on designing a vaccine or cure strategy for two of South Africa's major killer diseases, HIV and

TB. He works to understand how the immune system fights off these diseases, and how these pathogens in turn evade or adapt to continuous immune pressure. Ndung'u is also the South African Research Chair in Systems Biology of HIV/Aids, a Max Planck Institute for Infection Biology Research Group Leader, Adjunct Professor at the Harvard School of Public Health, and the Scientific Director at UKZN's HIV Pathogenesis Programme.



WHO supports a rare virus containment



World Health Organisation (WHO) is working to contain an outbreak of Marburg virus disease (MVD) that has appeared in eastern Uganda on the border with Kenya. Several hundred people may have been exposed to the virus at health facilities and at traditional burial ceremonies in Kween District, a mountainous area 300 kilometres northeast of Kampala.

The Ministry of Health has sent a rapid response team to the area supported by staff from the World Health Organization, the Centers for Disease Control and Prevention (CDC) and the African Field Epidemiology Network (AFNET). WHO is providing medical supplies, guidance on safe and dignified burials, and has released USD 500 000 from its Contingency Fund for Emergencies to finance immediate response activities.

Marburg virus disease is a rare disease with a high mortality rate for which there is no specific treatment. This virus is among the most virulent pathogens known to infect humans. Although MVD is rare, it can result in large outbreaks with high case fatality rates ranging from 23 to 90 per cent.

WHO identifies South Africa as priority country for plague

South Africa is one of nine countries which have been prioritised by the World Health Organisation (WHO) to prepare itself for possible "black death" plague cases. This was due to its trade and travel links with Madagascar. The other eight countries at risk include the Comoros, Ethiopia, Kenya, Mauritius, Mozambique, France's La Réunion, the Seychelles, and Tanzania.

Madagascar was reportedly hit with the black death in September, and health authorities are concerned because it has affected urban areas, increasing the risk of transmission and spread. A recent update on the outbreak, released in a WHO report, stated that South Africa's travel and trade links with Madagascar, where the outbreak has already killed 124 people and infected 1 133, has put it at risk.

The organisation says that the overall risk of the plague is very high in Madagascar and that, depending on the type of plague, there is a 30 to 100 per cent chance of death within 72 hours if it is left untreated. Antibiotics can be used to treat it upon early detection.



CPSI joins WHO for improved medication safety

The Canadian Patient Safety Institute (CPSI) is joining the World Health Organization (WHO) in their global campaign to reduce medication errors. The WHO states that unsafe medication practices and medication errors are a leading cause of injury and avoidable harm in healthcare systems across the world. Globally, the cost associated with medication errors has been estimated at \$42 billion annually. As a World Health Organization Collaborating Centre for Patient Safety and Patient Engagement, the Canadian Patient Safety Institute is coordinating the Medication Without Harm campaign in Canada. "Know. Check. Ask." is the call to action to encourage patients and healthcare providers to take an active role in medication use and for global solidarity and action by the international community to reduce avoidable medication-related harm.

Over the course of the next five years, the Canadian Patient Safety Institute together with patients and partners will develop and execute an implementation plan, monitor and evaluate progress made and work closely with the World Health Organization to ensure the long-term sustainability of strategies implemented over the course of the Medication Without Harm campaign.

Women Achievers Walking with Purpose



Diversity inclusion is increasingly becoming an important top-of-the-list board room agenda for a large number of corporations, and for good reason. In this context and talking specifically about gender biases, these have particularly plagued our societies for yore – relegating women to roles that have traditionally been perceived as more feminine in nature but also arguably make a lesser contribution and come with curtailed responsibilities and influence.

There has however been some perceptible and positive change in recent years. A large measure of this is driven by some pioneering female leadership that has emerged across industries, and these women have managed to change the narrative and focus through their own example and by bringing a perspective that was hitherto missing. Corporates are also waking up to the realization that this is not merely a feel-good factor. In a macroeconomic environment that now consistently demands innovation and cost efficiencies - engaging their workforce in a gender agnostic way will also translate into better employee engagement and overall productivity, which ultimately leads to a more resilient and growing bottom-line.

Women have been struggling to prove their prowess in every

field and obtaining equal rights. The pharmaceutical and healthcare industry across the globe has long been dominated by men, a trait that is prevalent in other industries worldwide.

In a similar vein, a big change is now also sweeping across the immensely technical and challenging business landscape of the pharmaceutical and healthcare industry across the globe. In the last few decades, laboratory and pharma business world has seen significant positive changes. Today, the industry is witnessing fantastic female leaders emerging at the top, who not only hold positions of power within some of the biggest pharmaceutical and healthcare companies, but are also coming up with innovative game-changing ideas and services. Their business acumen apart, these women add tremendous value in shaping their organisations.

This increase is not, for the most part, due to any generic positive discrimination created by pharma companies, but a rapidly growing recognition of the talent and outstanding contribution women bring and will continue to bring in the future.

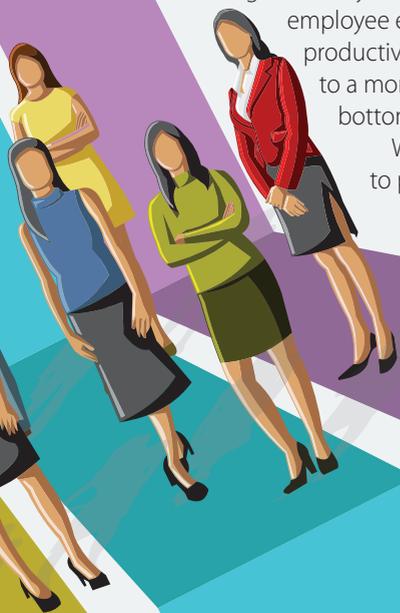
UNSEEN BARRIERS

The progress made by women at work is substantial despite of facing barriers like outright sexism, as well as more subtle-but-powerful institutional gender biases, which remain stubbornly ingrained in business, as they do in day-to-day life. Deborah Rathjen, CEO, Bionomics has some numbers to share, "In 2016 *Forbes*' article titled "the World's 10 most powerful CEO's", not a single female made the cut. Delving deeper into the world's top-earning pharma CEO's of 2016, again women barely stood a chance, coming in at twelfth, among a sea of men. There is no doubt that the pharmaceutical industry is a male dominated world. However, with the recent appointment of a female CEO at global pharma GSK, increasing numbers of successful female CEOs in biotech, and with more females choosing science as a career pathway than ever before, we can hope to close the gap in gender equality. Important to note is that latest research also suggests that returns to VCs are higher when there is a female CEO."

But much more needs to be done, even as the metaphorical glass ceiling is only just getting acknowledged but not necessarily being dismantled. Even in today's time and work culture, where women are still discriminated against, how difficult is it for women to succeed in male dominated work spheres? Is it true that women cannot maintain balance between work and family? Is gender equality still a distant concept?

WORK/LIFE BALANCE

Reaching the top management generally takes years of hard work, dedication and personal growth to fulfil the demands of these roles. The game is up one level



COVER STORY

especially when factoring in a family. For women balancing their career while being the primary caregiver of the household, their social conditioning encourages them to put home before career. It's also true that women are often gently but firmly nudged off this path more frequently than men, when there is an invariable clash between work and family.

Linda Seah, Head of South East Asia Cluster, Shire comments on this issue. "Assuming that they have the same credentials, there isn't a level playing field for women, as society norms expect them to play different roles at home as a wife, a mother, a daughter. Today it takes a seasoned female leader to be able to lead by example and challenge the status quo but that usually comes after a woman has fulfilled the needs for her family first."

Many work/life conflicts emerge for women when caring for a family. These conflicts can cause women to take a step back, which in turn can lead to a restriction in career opportunities and advancement. However, with some conscious effort and focus, the magic "balance" can be attained. "I'll call it serial prioritization", says Myra Eskes, President & CEO at GE Healthcare Southeast Asia. "The realization that you cannot do everything (family, kids, work, social life, hobbies) you want to do at the same pace at the same time is important. You can strive to have it all – just not all at the same time."

LEADERSHIP SKILLS

Women in leadership face many barriers. Many of the challenges come from other people. Yet some challenges are self-imposed. Many-a-times, women are either not confident enough to believe in their ability, or sadly enough, are hesitant to demand and expect the right to be treated fairly.

Rhenu Bhuller, Partner & Senior Vice President, Transformational Health, Frost & Sullivan, believes that men are probably more impatient, more likely to want to see quick results and tend to look out more actively for the next big thing in comparison to women. "Women tend to be a little more cautious and want to be really sure before they go for something, so may be more hesitant to change or even more hesitant to apply for a position or push for a promotion unless they believe they are truly qualified for it, while men may give it a go if they fill three out of five criteria", she adds.

GENDER BIAS

Industry is changing. There have been huge changes for women in terms of employment in the past 50 years, with women moving into paid employment outside the home in ways that their grandmothers and even their mothers could only dream of. Women are also meandering into jobs that were only dominated by men.

In the private sector, women are on most boards of

RESEARCH STUDIES SHOW THAT ONLY ABOUT 7-9% OF CHIEF EXECUTIVE ROLES ARE FILLED BY WOMEN IN BIOTECHNOLOGY SECTOR. HOWEVER, THIS IS NOT AN ISSUE THAT'S UNIQUE TO DRUG MAKERS; AMONG THE FORTUNE 500, 6.4% WERE LED BY FEMALE CEOs

directors of large companies but their number remains low compared to that for men. Furthermore, the "glass ceiling" has hindered women's access to leadership positions in private companies. This is especially notable in the largest corporations, which remain male-dominated.

While it is globally accepted that women leaders bring immense value to their companies, they still remain scarce at the top of organizations. Research studies show that only about 7-9% of chief executive roles are filled by women in biotechnology sector. However, this is not an issue that's unique to drug makers; among the Fortune 500, 6.4% were led by female CEOs.

Does the glass cliff set up women for failure? Not necessarily, says Arleen Paulino, Vice-President of Amgen Singapore Manufacturing. In fact, she looks at the opportunity as a chance to shine. "I do have greater autonomy and feel quite empowered but I also now truly feel the weight of my decisions", she says. "As a senior leader, there is no other safety net if I either make the wrong decision or fail to make timely decisions."

Talking about the women in pharma industry in next 20 years, Myra Eskes, President & CEO, GE Healthcare Southeast says, "Don't feel intimidated about being the 'only woman' in the room, or the odd one out in terms of experience, background or nationality for that matter. You are there, and you should stay, because you have something to offer. And you can also contribute something from a new perspective."

BioSpectrum Asia pays homage to women leaders who have stood against odds and have made their own 'space-on-stage' in the field of biotechnology- women who have been successful in striking a balance between family and work, women who have proved their mettle, wading through troubled waters. They have not been afraid to take risks while making senior role decisions, nor have cut corners because of their gender. They have embedded a culture of inclusive environment and pushed for HR reforms targeted at women in the DNA of their companies. Our latest edition is devoted to the role of these women achievers for their meticulous work and unprecedented leadership skills in the field of biotechnology and pharmaceutical sector.

Stepping up with confidence



DR CHRISTIANE HAMACHER

Head Region Asia Pacific,
Roche Pharmaceutical,
Singapore

DR CHRISTIANE
HELPED ROCHE
TO BUILD
STRONGER
RELATIONSHIPS
WITH PHYSICIANS,
REGULATORS AND
HEALTH CARE
AUTHORITIES IN
APAC TO FULFIL
UNMET MEDICAL
NEED

On November 1, 2016, Roche Pharmaceuticals Asia Pacific announced that Dr Christiane Hamacher assumed the role of Head of Asia Pacific, joining Roche's global Pharmaceutical Leadership Team. Based in Singapore, the company's regional headquarters, she leads more than 6,000 employees in 22 countries across the region.

Dr Christiane is responsible for the development and commercialization of Roche Pharmaceuticals' innovative portfolio of medicines across Asia Pacific (APAC). As the head of the APAC region, she helped Roche to build stronger relationships with physicians, regulators and health care authorities in APAC to fulfil unmet medical needs.

Talking about her current role, Dr Christiane says, "I expected that working across several different countries, cultures and healthcare systems would be complex: and it has been! We are always looking at how we can improve processes and reduce complexity, but there simply are no "one size fits all" solutions to the challenges facing patients in Asia-Pacific. The advantage of such diversity is that we can all learn from each other."

Dr Christiane joined Roche in 2007. She was most recently General Manager of Roche Pharmaceuticals' Czech Republic business. Dr Christiane has established a strong track record in strategic management and human resources, and has undertaken global commercial and operational roles in the US, Europe and Asia.

At Roche, Dr Christiane's roles have included the positions of General Manager Norway, Life Cycle Leader, Virology and Resourcing Manager in Group Human Resources. Sharing her

insights on gender parity in the industry, Dr Christiane highlighted that 53% of Roche's APAC leaders are women and Roche is 'not male-dominated'. She says, "Roche has been a real leader in this area. In APAC region for Roche Pharma, the female to male ratio is 4:3. And 53% of our managers are women. The task for us is to make our organization even more inclusive at every level."

Prior to joining Roche, Dr Christiane spent 10 years at Schering where she held senior managerial positions in oncology, human resources and was General Manager the Philippines. Dr Christiane holds a PhD from the University Clinic Bergmannsheil / Ruhr- University of Bochum, Germany. Her scientific work was focused on oncology, molecular biology and signal transduction. She also studied Economics at the University of Hagen, Germany.

She added that to achieve success it is important to 'truly love the work one does'. "Society has had different expectations for men and women. But that is changing. There's still a long way to go, but it's going in the right direction. It is so important for everyone to take personal responsibility for their career plan – especially women. We cannot expect anyone else to map out a career path for us.

Taking control of your career as a woman means being courageous, being willing to voice their opinions and stepping up with confidence when opportunities arise. The more we do that, the faster people will leave behind outdated career expectations for men and women. Finally, be willing to seize opportunities and take on additional responsibility - don't wait until you feel you are 100% ready."



ARLEEN PAULINO

Vice-President of Amgen
Singapore Manufacturing,
Singapore

WITH OVER 25
YEARS' EXPERIENCE
IN R&D AND
COMMERCIAL
SERVICES,
ARLEEN PAULINO
LEADS A CROSS
FUNCTIONAL TEAM
ACROSS VARIOUS
DEPARTMENTS AND
IS RESPONSIBLE FOR
SITE OPERATIONS
AT AMGEN'S
BIOMANUFACTURING
FACILITY

Prioritizing competing demands

Arleen Paulino has been in the biotechnology industry for the past 25 years, most of which has been between pure R&D and commercial. Working as Vice President of Amgen Singapore manufacturing since Jan 2016, Arleen Pauline is responsible for site operations at Amgen's new biomanufacturing facility and leads a cross functional team across various departments.

Established in November 2014, Amgen's Next-Generation Biomanufacturing facility in Singapore heralds a new juncture of efficient and innovative commercial-scale production of medicines. First in Asia, it is one of the newest manufacturing site, which uses a revolutionary approach incorporating multiple technologies to enable greater speed, productivity and flexibility.

This facility will produce Amgen's global supply of denosumab, which then gets fed to the company's Puerto Rico facility to ultimately produce Prolia® and XGEVA®—two medicines for patients with skeletal-related disorders (e.g. osteoporosis and bone metastasis).

On the issue of gender disparity in the field of biotechnology, Arleen chronically said that there might have been a perception that this industry was largely a male-dominated industry in the past, but there have been many remarkable women that have risen the ranks in the field in the recent years. "The biotechnology industry has certainly set the pace for other industries and sectors in terms of female representation, but there is definitely still room for more women leadership in executive and decision-making positions", she added.

Arleen Paulino gets in-depth about how women need self-empowerment

in the new era. "In the harsh and rapidly-evolving business environment in the world today, women need to remain resilient and versatile, and boost our networking skills to achieve our ambitions and business goals. We need to not stand in our own way and we need to support one another."

As a senior leader at Amgen, and with higher responsibilities, VP of Singapore Site Operations, Arleen feels quite empowered but also understands the true weight and autonomy of her decisions. She pinpoints that there is no safety net if she either makes the wrong decision or fail to make timely decisions.

Amgen boasts a long history of manufacturing, having established a very extensive global network of facilities that incorporate conventional technologies and infrastructure. "At Amgen, our mission is to serve patients and we have a set of values that guide us in how we should behave in order to achieve that mission. These values are the foundation for our culture and this has been a good guide to the culture we need to build", Arleen says proudly.

A travel and a food enthusiast, Arleen manages the demands of her high-octane role in a global organization by following a five-pronged approach: being very organized in her schedule, effectively communicating with everyone, being self-disciplined, taking good care of herself and effectively prioritizing competing demands on her time by not being afraid to say a no when needed. She is an ardent believer that as long as we are learning at the job, enjoying the company of the people we work with and getting a sense of accomplishment in making a meaningful difference, any role will be a rewarding one.

Leading the business with consistent growth

Lily Zhu, is currently the Global Commercial Operations Lead for Pfizer China. Prior to this role, Lily was the Director of Commercial Operations & Effectiveness (COE) where she led the COE team which included sales training, Field Force (FF) effectiveness and providing support to all business units and divisions within Pfizer China. Under her leadership, Pfizer's business has seen consistent growth and maintained its position as a leading pharmaceutical company in China.

Lily began her career at Pfizer China in 1996 as a sales representative, and over the past 13 years, has held many sales and sales management positions across the business, including Associate National Sales Director for Oncology, and Associate Director of Commercial Effectiveness (CE) for Pfizer China. Speaking about her early days with Pfizer, Lily says, "The biggest difference for me today compared to when I started in sales, was that back then my focus was on how to support my direct manager and my relatively small, sales team. Now as a leader of operations for an entire organization, my focus is so much broader and I have to view the needs of the business from multiple angles and take a very strategic approach to my work."

Lily says that most of the industries in China provide equal opportunities for men and women. "I think all industries in China, including the pharmaceutical industry, have basically reached gender parity when it comes to career development. In my

experience, I have seen that both male and female employees at Pfizer are provided with equal and fair career opportunities. However, I think the challenges comes from a difference in leadership traits between men and women and also individual personalities. For example, I would always look-up to some of my male colleagues for being naturally strong, strategic thinkers and I would strive to be more like them. In parallel, many of my male colleagues have commented on my creativity and ability to innovate which they may lack. She opines that when it comes to planning careers, men are more assertive and willing to showcase their abilities whereas women maybe more inclined to take a subtle approach and may prefer being in a team or a function that offers behind-the-scenes support such as Operations.

In her current role, she leads Sales & Marketing Services (SMS), Business Intelligence and Insight (BAI), Customer Engagement (CE) and Sales Training. China's multi-channel marketing function also have dotted line reporting to her. Lily is also the Co-Lead of Pfizer APAC Women Council. In her advice to fellow women achievers, Lily says, "We can be as ambitious as male leaders. We just need to transcend the traditional gender restraints that we put upon ourselves and set higher aspirations. Also, finding the right balance between family and career, is critical."

Lily has a Bachelor's degree from China Zhejiang Medical University and an EMBA degree from Beijing University.



LILY ZHU

GCO, China Lead, Pfizer

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RECIPIENT OF THE "RISING STAR" 2016 BY THE HEALTHCARE BUSINESS WOMEN ASSOCIATION, LILY ZHU HAS BEEN DRIVING PFIZER'S BUSINESS AND MAINTAINED ITS POSITION AS A LEADING PHARMACEUTICAL COMPANY IN CHINA



MYRA ESKES

President & CEO,
GE Healthcare Southeast Asia,
Singapore

MYRA ESKES IS COGNIZANT OF THE POTENTIAL OF NURTURING AND MENTORING WOMEN TO POSITIONS WHERE THEY CAN HELP SHAPE THE FUTURE OF GLOBAL HEALTH

Improving lives in moments that matter

Myra Eskes is President & CEO at GE Healthcare Southeast Asia. She is a senior executive with over 20 years of global and leadership experience in the medical devices and life sciences industry. She has expertise in building high performing sales and service teams to deliver innovative and cost-effective healthcare solutions in emerging markets. Prior to her current role, Myra led the GEHC Life Sciences business for the Eastern & African Growth markets, covering Turkey, the Middle East, Africa and Russia/CIS countries.

Myra considers the healthcare entrepreneurs in emerging markets as her role models, as their drive, courage, risk-appetite and focus to make an impact on their communities is a real source of inspiration for her. She noted, "When I started in the medical devices industry with GE in the US, I thought my career was going to be in supply chain, driving productivity and lean manufacturing. Fifteen years later, I found myself leading the GE Life Sciences business in Turkey, the Middle East and Russia, working with pharma start-ups, selling biopharmaceutical factories. Things are very different again today as I lead the GE Healthcare business in Southeast Asia."

A common thread in her career at GE, which has spanned across continents and divisions, is the opportunity she has had to be pivotal in "Improving Lives in Moments That Matter". It is also what she says makes her job meaningful, and gives her the confidence and motivation in overcoming challenges. Through the GE teams in Sustainable Healthcare Solutions, Myra's business focus is on developing disruptive, low-cost

technologies and healthcare delivery solutions relevant to multiple care settings and non-traditional users in the emerging markets.

With a lot of clarity and focus towards her professional goals, Myra has always believed in GE's equality-at-work approach. While discussing the challenges of navigating gender norms as a woman leader, she says proudly, "I can say I have never paid much attention to how male-dominated my environment is, nor have I seen it as a special challenge. I have had the advantage that I have always worked for a company – GE – where equal opportunity and meritocracy are not just talk, but actually put in practice. If you are capable and up for the challenge of the job, you can go do it."

Also, as a woman leader herself, she is cognizant of the potential of nurturing and mentoring women to positions where they can help shape the future of global health, and this is another of her focus areas in the organization. However, she admits that women do have some self-imposed pressures, "First, women are less likely than men to raise their hand for a job without being asked to apply. Or to ask for a raise for that matter! Second, when women have children there can be a slowdown in career progress, because it may temporarily impact how they decide on a next career step."

Talking about her present challenges, Myra Eskes plans to leverage these opportunities for her personal growth and learning. She believes that overcoming these impediments will make a positive contribution to "change the face of global health for the future, we need to help recognize, develop and grow women leadership".

Seizing opportunity however small it may be

A seasoned biotech executive of over 20 years, Dr Deborah Rathjen joined Bionomics in June 2000 from Peptech Limited, where she was Manager of Business Development and Licensing. She was a co-inventor of Peptech's TNF technology and leader of the company's successful defence of its key TNF patents against a legal challenge by BASF, providing Peptech with a strong commercial basis for licensing negotiations with BASF, Centocor and other companies with anti-TNF products.

Currently the CEO of Bionomics, she has been instrumental in turning Bionomics from a virtual company into a notable biopharmaceutical firm. Her role in the development of cancer treating drugs and other medications is a large contribution to Bionomics' current success in the biotechnology market.

Dr Rathjen has significant experience in company building and financing, mergers and acquisitions, therapeutic product research and development, business development, licensing and commercialization.

Under her leadership, Bionomics struck a potentially lucrative research deal with American pharmaceutical giant Merck to define new pain treatments. The two-year research programme, if successful, has the potential to yield up to US\$172 million (A\$191 million) through fees and milestone payments for Bionomics and undisclosed royalty sales. Dr Rathjen mentioned, "Having Merck as a partner not only has placed Bionomics on the pharmaceutical map, but having them as investors continues to validate our technologies and expertise."

When asked about her success mantra, Dr Rathjen said, "A mantra of mine personally which has also been adopted at Bionomics is "N.O.W" – NO

OPPORTUNITY WASTED. Seizing any opportunity is how a small interaction or chance meeting can turn into successful business. Why wait for tomorrow to schedule that meeting or make that phone call?"

Sharing her thoughts on gender parity in the industry, Dr Rathjen says, "Women are inherently planners. Although there may be some differences in the way that males and females plan their career, inherently, women who want a career as well as a family must plan in order to ensure the success of both. With respect to biology, this is a major difference between the sexes. Women must continue to worry less about fitting into glass slippers and more about shattering glass ceilings. To strive to make your mark in a male dominated industry."

Dr Rathjen has been recognised both in Australia and internationally through awards and honours including the 2004 AusBiotech President's Medal, 2006 Flinders University Distinguished Alumni Award, 2009 BioSingapore Asia Pacific Biotechnology Woman Entrepreneur of the Year, 2009 Regional Finalist Ernst & Young - Entrepreneur of the Year, and 2014 Woman Executive of the Year BioPharm Industry Awards. In 2015 Dr Rathjen was included in the Top 50 most influential Australia business women by The Australian newspaper.

Speaking about challenges in her career, Dr Rathjen said, "In the work place there are numerous challenges however being taken seriously not only as a woman in science but as a businesswoman has been a particular challenge. Balancing family and career and having to prove that you can successfully do both although, a challenge, has been something I pride myself on."



DR DEBORAH RATHJEN

CEO, Bionomics, Australia

HAVING WON 2014 WOMAN EXECUTIVE OF THE YEAR BIOPHARM INDUSTRY AWARD, DR DEBORAH RATHJEN, HAS BEEN PLAYING A KEY ROLE IN THE DEVELOPMENT OF CANCER TREATING DRUGS AND OTHER MEDICATIONS

WOMEN ON BOARDS IN ASIA PACIFIC

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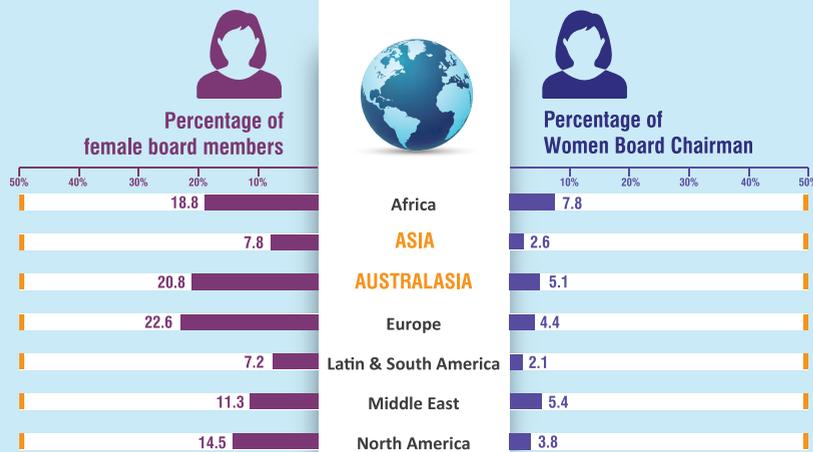


INDUSTRY WISE GENDER DIVERSITY IN ASIA PACIFIC



CONTINENT WISE % OF WOMEN ON BOARDS

ASIA PACIFIC AVERAGE 10.2%



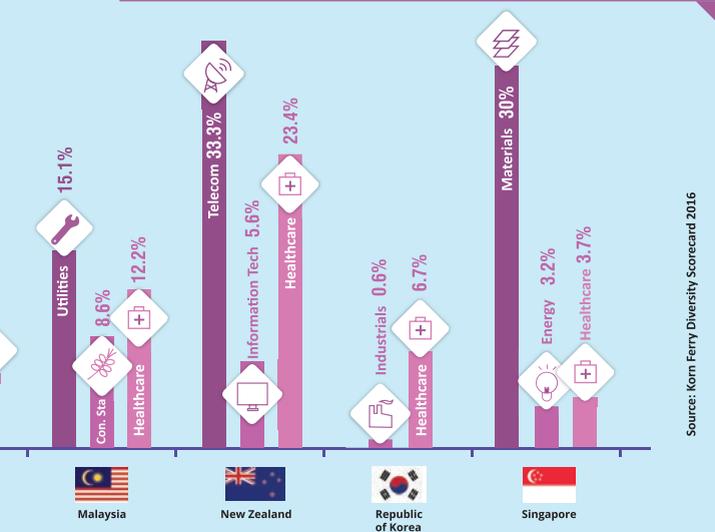
PARTNER

We know that the gender diversity discussion across the world. I believe the discussion focused on having more women on boards is a supportive of this change and change can only happen with our debate and discussion.

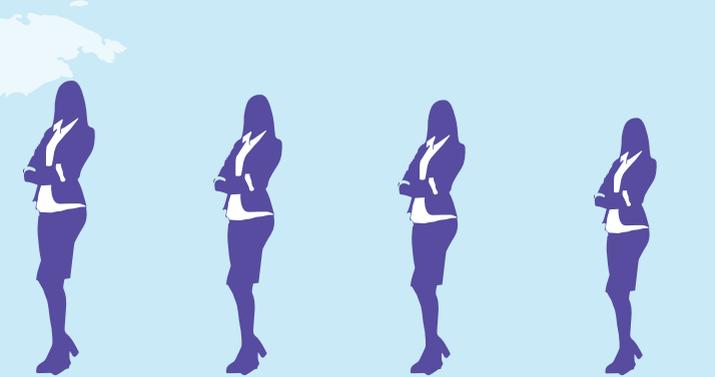
Source: Deloitte: Women in boardroom 5 Edition.

Compiled by MMA Spectrum Analytics Team

COUNTRY WISE FEMALE BOARD MEMBERS IN ASIA PACIFIC



Source: Korn Ferry Diversity Scorecard 2016



Source: Korn Ferry Diversity Scorecard 2016
Gender diversity at work is fair representation between men and women at any workplace

MS REENITA DAS, & SVP TRANSFORMATIONAL HEALTHCARE FROST & SULLIVAN



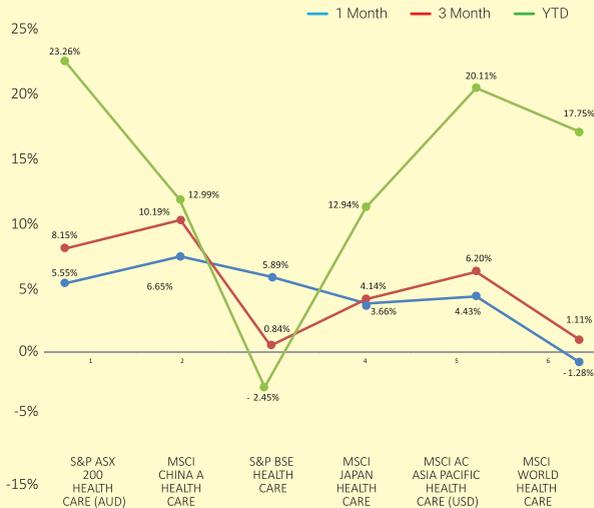
... and race gap goes right to the top that today the dialogue needs to move represented in every sphere of life to a low to bring men into the folds and of culture. Men represented 50% of the population and with their support. We need to become much more inclusive n to make progress.



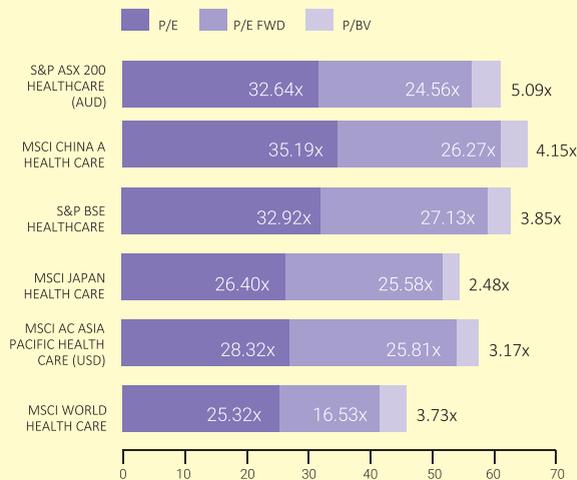
Asian Stock Markets Update

(As of 31st October)

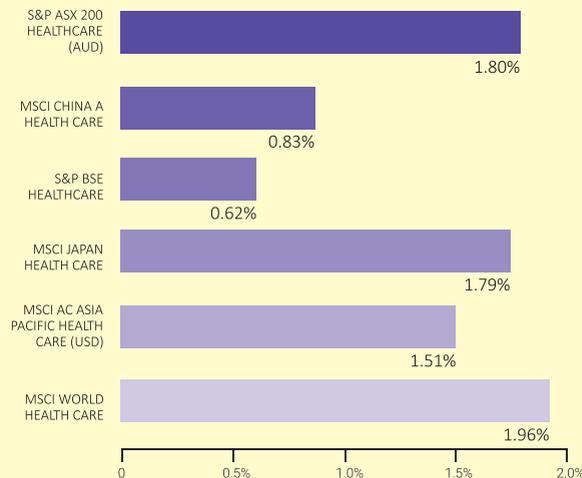
INDEX RETURNS



FUNDAMENTALS (VALUATION RATIOS)



FUNDAMENTALS (DIV. YLD %)



Source: MSCI and S&P Factsheets



RHENU BHULLER

Partner & Senior Vice President,
Transformational Health,
Frost & Sullivan, Singapore

RHENU BHULLER -
THE FIRST FEMALE
PARTNER IN ASIA,
FIRST MALAYSIAN,
AND ONLY 1
OF 3 WOMEN
WORLDWIDE
IN FRONT &
SULLIVAN

Seizing opportunities to give back to society

Rhenu Bhuller is a Partner & Senior Vice President – Transformational Health at Frost & Sullivan, and also a founding member of the consulting firm's APAC operations in Singapore. She has been at the forefront of pioneering new initiatives here in the region, working with clients globally across developed and emerging markets. She is part of F&S's global Visionary Innovation group as well as a thought leader within the Transformational Health team.

With a background in sales and marketing and 20 years of research and consulting experience, Rhenu has worked with both global MNCs as well as regional companies in market strategy, industry convergence and business model innovation to take advantage of mega trends and related opportunities.

She satisfactorily states that she has been fortunate to learn from the job and gain experience during her early times that enhanced her abilities. However, with industry 4.0 now, the pace of learning and level of information available as well as the computational ability has dramatically increased.

Rhenu was quite open about the topic of gender disparity. She noted, "Data shows that women, including those at Frost & Sullivan, start out at full speed. The number of men and women on staff are close when you add up the junior and mid-levels. However, women drop off considerably as you move up the ladder."

Rhenu is also extremely passionate about equality and diversity, and leads the APAC professional women network for the firm, designed to create the foundations for growth and leadership of women in making a positive impact

on the economy and business. This new initiative started by F&S for women - Growth and Leadership of Women (GLOW) - will encourage and help incorporate more women into critical corporate decision-making and bring in the diversity that is so needed in today's business environment.

Rhenu has taken challenging roles, and excelled in them at international levels – be it taking the role of Managing Director of F&S Australian operations or being partner at the firm - the first female partner in Asia, first Malaysian, and only 1 of 3 women worldwide.

Coming from a family of sports enthusiasts, fitness is something Rhenu has enjoyed since her childhood. Even work pressures and travel demands haven't dampened this, and she makes all efforts to accommodate workout sessions despite her busy schedule. At this stage of her career, what really motivates her is seizing opportunities that will help her give back to the society, while still maintaining a balance between career and family.

Talking about the role model, Rhenu says her father has always been an inspiration to her from an extremely young age. The values that he held and that he taught her in terms of work and personal ethics, sharing and caring for those who may not have as much as we have and always seeing the good in people.

"My other inspiration was my maternal grandmother who in the 1950s was an entrepreneur who started her own successful business, ignoring those who told her it would be a failure and that women could not do business, so even at that time she showed us what strength women had," she recalls.

Spreading the breadth of opportunities



DR YOONI KIM

Executive Director,
Asia Operations,
Novotech, Singapore

DR YOONI KIM
HAS BEEN
HELPING THE NEXT
GENERATION OF
FEMALE CLINICAL
TRIAL EXECUTIVES
TO GROW IN THE
INDUSTRY

Dr Yooni Kim, Executive Director, Asia operations, Novotech is responsible for overseeing Novotech's operations and project delivery within the Asia region. Dr Kim is very experienced in Asia's drug development industry, having managed operations for South Korea, Taiwan, China, Hong Kong, Singapore, Malaysia, Indonesia, Thailand, the Philippines, India and Japan.

Dr Yooni has worked at various positions in clinical development, medical affairs, and pharmacovigilance at GSK and operational management role for North Asia in a leading global CRO. In her vast career spanning over 20 years, she has been instrumental in making the international clinical trial industry recognise the value and breadth of opportunity available and build a bigger sized team in Asia.

Speaking about the challenges faced in her career, Dr Yooni says, "A majority of the gender/job related challenges and pressures I faced during my career came more from perceptions of senior management position in the industry, mostly in Asian society itself; rather than from within the workplace or in similar environments in United States or Europe. There many occasions when clients from Asia expected to meet a male executive and were surprised to discover I was female. This was challenging when having to build close relationships based on social consensus with clients. There are now, however, more females in senior positions – and this is why it is so important that we, as an industry and workplace, strive to continue changing these societally-biased opinions."

Dr Yooni has spoken widely regarding the current landscape of

clinical development in Asia, and she is a Key Opinion Leader in communicating to the world the potential and talent of Asian companies and the benefits of skilled labour available in Asia.

Dr Yooni says one of her key achievements is to see her team grow into executive positions in the industry worldwide. "One of my most important career achievements is developing the talent of my staff. A number of my team started with me as fresh graduates and have gone on to more important roles such as leading clinical trials of excellence in Asia."

"Being able to grow my staff into more senior executive positions within Novotech has greatly helped the company's expansion throughout Asia. More than half our Country Heads in Asia are women. This is quite unique within Asia; and I feel played strong part in growing this next generation."

Dr Yooni has pharmacist background and received doctorate degree of medicine from Seoul National University, specializing in Preventive Medicine and Epidemiology. Under her leadership, Novotech is expanding its presence and footprint in Asia, with nine country offices throughout the region. Novotech has also launched a new SMO (Site Management Organisation) business in response to unmet industry need in South Korea and Taiwan.

Dr Yooni opines that women need to give equal priority to professional life as personal life. "Women are cursed with always trying to be superwomen. They try to be everything to everyone at all times. This pressure is especially true in Asia due to country-specific cultural and social pressures. It is important for women to realise that you cannot make everyone happy."



**BHAVANI
SIVALINGAM**
Head of R&D Solutions, APAC,
IQVIA, Singapore

PROUD TO BE
PART OF IQVIA
(QUINTILES) TEAM
THAT WAS NAMED
ASIA PACIFIC CRO
OF THE YEAR BY
FROST & SULLIVAN
FOR EIGHT TIMES
IN 10 YEARS

Climbing the ladder with continuous learning

Bhavani Sivalingam has more than two decades' experience in clinical research, including 20 years with IQVIA (then Quintiles), where she has held roles of increasing responsibility across the region.

Today, Bhavani is a pioneer member of the IQVIA Asia Pacific team and has played a key role in the company's growth in the region. Since 1993, IQVIA (then Quintiles) has expanded its clinical operations from a few hundred employees in Asia Pacific to become the region's largest provider of R&D Solutions and market access services, with 14,000 employees operating from more than 30 locations across Asia Pacific.

In her current role, Bhavani leads the R&D function for IQVIA in Asia – which includes clinical operations, clinical Global Functional Resourcing (GFR), customer alliances and quality management – all focused on efficient, high-quality delivery of product development services for IQVIA clients in Asia Pacific.

Nearly 20 years ago Bhavani had joined IQVIA as a Project Manager. Speaking about her early days with IQVIA, Bhavani, says, "My job now as IQVIA's head of R&D Solutions in Asia Pacific is much different than when I was a project manager 20 years ago. At that time Quintiles (now IQVIA) had just opened its first office in Singapore. I had studied science and I wanted to work with people. My first job combined both – perfect! My expectations today really haven't changed – but the scale is much larger. I've always enjoyed orchestrating work to accomplish a goal. I did that starting out as a project manager, then working with our key customers, and

now as head of IQVIA R&D Solutions in Asia. I'm excited about prospects for change – now more than ever because of advances in science, medicine and technology."

Bhavani has extensive experience in cardiology, oncology and infectious diseases, and vaccine studies. Prior to her current role, Bhavani was head of IQVIA's strategic alliances for Asia Pacific.

She adds that her career path has been guided more by her interests than a master plan. "I didn't actively plan how I was going to climb the career ladder but instead focused on following my passion and continuously learning from each experience. One thread that runs through my career and our company is continuous improvement, especially in quality. It's helped differentiate our company and drive our growth in Asia and globally. Vaccines development is another intersection between my passion and my work. I started out working on vaccines trials. I've seen Asia Pacific become a leading region for vaccine development. The value of these vaccines is enormous in terms of reducing suffering, controlling outbreaks and eradicating virulent strains."

Speaking on gender parity in the industry, Bhavani said gender parity begins with education and giving girls equal opportunities in science, technology, engineering and math. "Professional confidence is not gender-based; it's all about authenticity and developing the qualities that resonate with who you are. Governments and companies can do their part of encouraging and supporting women who want to pursue a career in the life sciences. We've come a long way but there's much more to be done."

Leading in developing affordable biologics



DR NOELLE SUNSTROM

CEO, NeuClone, Australia

—

RECIPIENT OF THE INAUGURAL WINNER OF THE WOMEN IN EXPORT SCHOLARSHIP DELIVERED IN PARTNERSHIP BY AUSTRALIA AND CHIEF EXECUTIVE WOMEN (CEW) DR NOELLE SUNSTROM HAS BEEN WORKING ON PRODUCTION OF BIOLOGIC DRUGS

Dr Noelle Sunstrom is a Sydney based molecular biologist and CEO of NeuClone, a biopharmaceutical company that develops and commercializes high quality biosimilars. She has over 20 years of experience in the biopharmaceutical industry including more than 10 years of executive experience in biopharmaceutical companies.

Using groundbreaking technology that enhances the production of biologic drugs and reduces the cost of manufacture, NeuClone is making biosimilars to treat diseases such as cancer and autoimmune disorders. Under her leadership NeuClone currently has 10 biosimilars in the pipeline, including a copycat version of the highly effective breast cancer drug Herceptin. That biosimilar will go through clinical trials in the first quarter of 2018 and then on to global trials for regulatory approval and licensure around the world. Dr Sunstrom expects it to be on the market by 2022 and possibly earlier in India. From 2018 onward, NeuClone will have two drugs per year entering clinical trials.

Under her leadership, NeuClone's Right from the Start framework allows it to produce biosimilars of high quality while also reducing Dr Noelle Sunstrom manufacturing costs downstream. The Serum Institute, world's leading vaccine player is able to complement this by providing access to large scale manufacturing at the lowest possible cost, allowing both companies to deliver the highest quality drugs affordably.

In her illustrious career spanning across academia and industry, Dr Sunstrom has led teams in product development from bench to the market. Speaking about her current role, Dr Sunstrom said, "I expected that starting a company would be difficult

with many unforeseen challenges. Acknowledging this fact helps me cope with unexpected setbacks. I am most proud of building outstanding teams within the organization (scientific, business development, strategy and finance). Together we have increased substantially company and shareholder value."

Originally from Canada, Dr Sunstrom obtained a PhD from McGill University in Montreal before moving to Australia on a post-doctoral scholarship with the John Curtin School of Medical Research at the Australian National University. She began her academic research career at the University of New South Wales, where she led a team in producing monoclonal antibody drug therapies, collaborating with big pharma in taking those drugs to market. She and her team developed cutting-edge ways to produce complex biopharmaceuticals for commercial production.

In 2000, Dr Sunstrom co-founded Acyte Biotech, which commercializes intellectual property from the mammalian cell research groups at the University of New South Wales and University of Queensland. At Acyte Biotech, as Scientific Director she developed gene expression systems for the production of biopharmaceutical products in CHO cells. She was also the Executive Director, involved in setting strategic direction, developing research initiatives and practices; writing company documents including investment and business plans.

On challenges, Dr Sunstrom observes, "I don't believe in "tooting my own horn". I personally feel that one does not have to brag about one's achievements. Such behavior depreciates one's successes. With this philosophy, it is difficult to be heard above the noise of others proclaiming their brilliance.



DR SARAL THANGAM

CEO & Managing Director,
Norwich Clinical Services, India

LEADING IN
SETTING UP A
CRO DR SARAL
SPEARHEADED
THE COMPANY IN
INCREASING THE
HEADCOUNT BY
10 TIMES WHEN
THE INDUSTRY
WAS PASSING
THROUGH TOUGH
TIMES

Passion towards science and research

North American company Norwich has been serving the pharmaceutical industry for more than 100 years. In 2010, Norwich Pharmaceuticals, an Alvogen subsidiary, announced the formation of Norwich Clinical Services to provide clinical Research capabilities for further expanding the company's third party services.

Dr Saral Thangam then took the lead in setting up the CRO in Bengaluru, with an experienced team of professionals, each having more than 15 years of experience in clinical research and life sciences. Today, Norwich Clinical Services has state-of-the-art facilities, and exceptional expertise to conduct bioavailability and bioequivalence studies, clinical trials, drug metabolism studies, dose proportionality studies, multiple dose studies and pharmacovigilance.

Prior to joining Norwich, Dr Saral Thangam was the managing director of Lotus Labs. In addition, she has headed various operational units, including clinical pharmacology, clinical development, quality assurance and business development at Lotus. She has published and presented many research papers in scientific forums in international conferences.

The company started with around 20 employees, and under the expert guidance of Saral Thangam, the number has now reached close to 200. "We understand the complexities of drug development whether biotech, generic or pharma. Each member of our team has extensive experience in their area of expertise including leadership positions in the pharmaceutical sector and contract research organizations," shared Dr Saral

Thangam.

Dr Saral Thangam is a medical graduate from Christian Medical College, Vellore, and has a post graduate specialization in the field of Internal Medicine. She also holds a PhD in Physiology from St. John's National Academy of Health Sciences in India. This passion towards science and research led her to the position she currently holds in her career of more than 20 years.

Norwich Clinical Services is focused on quality, with multiple successful audits by USFDA, EMA and WHO. Their facilities are certified by Indian DCGI, the Brazilian Agency ANVISA and MOH Turkey. With an annual revenue around Rs 60 crore, Norwich Clinical Services has gained tremendous growth in the field of pharmacovigilance over the years. "Many CROs were facing problems few years back due to regulatory issues. Studies were being withdrawn from India during this phase of uncertainty. But we held on and focused our attention on pharmacovigilance and drug safety, and expanded in this direction".

She is a winner of several awards including prestigious Shakuntala Amirchand Award for significant contribution to biomedical sciences by the Indian Council of Medical Research (ICMR). Currently, she is part of the Executive Council at the Association of Clinical Research Organisation (ACRO).

"Norwich also offers corporate training services in various areas of clinical research for the Pharmaceutical, Clinical Research, Biotechnology and IT sectors. In the coming years, we are planning to work more in the direction of biosimilars," said Dr Saral Thangam.

Believing in hard work to succeed

With more than 25 years of extensive leadership experience in academia and industry Dr Pratima Srivastava, is the key member in the management team at GVK Bio, a leading Contract Research & Development (R&D) Organization that services the global Biopharma industry.

Working as a Director, Biological Services at GVK Bio Dr Pratima says, "While I started, I expected that this job will provide me a good platform to learn and enable me to contribute towards the growth of the organization. The things are not any different after four years. Today also I learn something new each day."

Prior to GVK Bio, Dr Pratima was associated with Lupin Research Pharma and Central Drug Research Institute (CDRI). In her extensive experience across academia and industry, Dr Pratima has established Drug Metabolism and Pharmacokinetics (DMPK) department in Lupin Research Park, Pune and Pharmacogenomics in CDRI, Lucknow.

During her illustrious career, has won ten awards, Prof. B.K. Bacchawat Memorial Young Scientist Award, Young Scientist Award by Council of Science and Technology, Prof. M.B. Mirza Award, Young Scientist Award in Health & Medical Sciences- Indian National Science Academy Medal, Young Scientist Award by International Union of Biochemistry and Molecular Biology, Gold Medal in Biochemistry by Indian Dr Pratima Society for Parasitology to name few of them.

She has commercialized three technologies, published nearly 65 papers in international journals and has 36 patents to her name. She has extensive research experience in the field of Molecular Biology, Pharmacokinetics, Drug Metabolism, Pharmacogenomics and Malaria Biochemistry.

Besides being the country representative of International Society for Development of Natural Products, she is associated with many organizations and institutes like Society of Biological Chemists, Indian Pharmaceutical Association, Indian Society for Parasitology, International Union of Biochemistry and Molecular Biology, International Society for Free Radical Biology and Medicine.

On gender parity Dr Pratima says, "Gender parity is not there in any of the industries. The same is applicable in Pharma industry as well. There is almost 1:10 ratio of females to males, this increases as we climb up the ladder. May be after 5 to 10 years, there will be better gender parity in every industry. In my opinion, there is not much difference between how males and females plan out progress in their careers. Nevertheless, the adjoining circumstances are responsible in it."

She adds that she did not face much challenges either personally or professionally while climbing up the ladder. "I am the elder sister having four younger brothers. My parents loved and cared for me more. My PhD guide had no discrimination between girls and boys, rather he used to say that girls also will get the higher degree as boys, so nothing to differentiate between them. After marriage, my husband has provided me support in all spheres of life. I find myself lucky enough to be a proud mother of two daughters who are very understanding and never give me any trouble."

Dr Pratima, who holds a PhD in Life Sciences from the Biochemistry Division, CDRI and Post-Doctoral Research Fellowship from the University of Texas, San Antonio and Roswell Park Cancer Institute, New York, believes that there is no short cut to success.



DR PRATIMA SRIVASTAVA

Director,
Biological Services, GVK Bio, India

—

RECIPIENT OF THE YOUNG SCIENTIST AWARD FROM INSA AND INTERNATIONAL UNION OF BIOCHEMISTRY AND MOLECULAR BIOLOGY DR PRATIMA HAS 36 PATENTS AND COMMERCIALIZED 3 TECHNOLOGIES



**DR JENNIFER
HOLMGREN**
CEO,
LanzaTech, New Zealand

HAVING WON 2015
BIO ROSALIND
FRANKLIN AWARD,
DR JENNIFER
HOLMGREN, IS
DEVELOPING
A VARIETY OF
PLATFORM
CHEMICALS
AND FUELS,
INCLUDING THE
WORLD'S FIRST
ALTERNATIVE JET
FUEL DERIVED
FROM INDUSTRIAL
WASTE GASES

Using challenges as a motivator to succeed

With over 20 years of experience in the energy sector including a proven track record in the development and commercialization of fuels and chemicals technologies, Dr Jennifer Holmgren joined LanzaTech as Chief Executive Officer in 2010. LanzaTech was established in Auckland, New Zealand in 2005, with strong financial backing from the Silicon Valley-based Venture capital group Khosla Ventures. Under the leadership of Dr. Jennifer Holmgren, the company closed a \$55.8 million Series C Round in 2012 with led by the Malaysian Life Sciences Capital Fund. Dr Holmgren went on to raise \$60 million in a first Series D Round led by Mitsui with a further \$60M from the NZ Superannuation Fund in 2014.

Prior to joining LanzaTech, Dr Holmgren was VP and General Manager of the Renewable Energy and Chemicals business unit at UOP LLC, a Honeywell Company. She was one of the key drivers of UOP's leadership in aviation biofuels, and under her management, UOP technology became instrumental in producing nearly all of the initial fuels used by commercial airlines and the military for testing and certification of alternative aviation fuel. Today, under Dr. Holmgren's guidance, LanzaTech is working towards developing a variety of platform chemicals and fuels, including the world's first alternative jet fuel derived from industrial waste gases.

Her leadership and innovations won her the most prestigious, 2015 BIO Rosalind Franklin Award. The Rosalind Franklin Award was established to honor pioneering women in the industrial biotechnology sector who have made significant contributions to the advancement of the biobased economy and biotech innovation.

Dr Holmgren said, "I have always believed that the technologies that have the most impact are those that create new industrial platforms. When I first heard about LanzaTech, I thought that this technology could do just that and thanks to an incredible team and a lot of patience, our technology is helping create a new industry, redefining how we treat carbon, source materials for fuels and chemicals production and how we treat waste. This one application can meet a variety of needs and work across multiple sectors and it has met all my expectations!"

She currently serves on multiple external advisory boards. She is the author or co-author of 50 US patents, 20 scientific publications and is the 2003 recipient of the Council for Chemical Research's (CCR) Malcolm E. Pruitt Award. She was named as #1 of the most 100 influential leaders in the Bioeconomy by Biofuels Digest for 2016-2017.

On challenges, she observes, "I think there are challenges in any field that you work in, and yes, sometimes you will face challenges that tend to be exacerbated by your age, nationality or sex. Throughout my career and my education, I have been fortunate to have professors, managers and peers who have pushed me to be the best I can be which has naturally helped me overcome any challenges that have arisen."

Sharing her thoughts on success mantra, Dr Holmgren says, "Just do your thing. Learn and learn and learn as much as you can, seek role models (both men and women), work at what you love, and remember that you are equal and have a seat at the table. The rest will come. You will succeed."

Improving biomedical environment

Dr Siew Hwa ONG knows a lot about growth. After stints as Post-doctoral Fellow at Mt Sinai Hospital, Canada and Assistant Professor at Institute of Molecular and cell, A*STAR, Dr Siew joined National University of Singapore in 2004. She was appointed the Chairman of BioSingapore in 2015, where she successfully continues to handle activities and initiatives tailored to improve the national biomedical and bioscience environment in order to solve challenges and capture opportunities.

An avid reader, Dr Siew Hwa ONG firmly believes in the importance of hard work in building any successful career. A professional, educationist and an expert in her field, she has trained and worked in Singapore, US, Canada, including in public research institutes, academia, hospitals, big pharma and start-up environment. Dr Siew Hwa Ong is presently the Director and Chief Scientist at Acumen Research Laboratories.

Founded in 2010, Acumen Research Laboratories (ARL) is a contract research organization (CRO) that provides a comprehensive range of customized, high-quality contract R&D services in drug target discovery and pre-clinical drug development to support the pharmaceutical industry and related biomedical sciences research communities world-wide.

"I worked for many years as a scientist in the academia and industry before starting my own company." Shuffling between her busy work schedule while balancing her personal priorities and family commitments, she really values the freedom that she has been able to achieve by starting her own company. She adds, "I would say

I'm indeed in the situation I expected, not an easy journey but the freedom I needed to do my work is very important – the peace between my heart & my mind."

Based in Singapore, Acumen Research Laboratories developed a new molecular diagnostic test for sepsis, including a novel sepsis host response test. Recently, they licensed this technology to a German company to commercialize in the US and Europe, and are now planning to enter the Chinese market as well.

While talking about her share of challenges and male disparity in the industry, Dr Siew said, "It is true that the industry remains very male-dominated. However, I would say each gender has his and her own intrinsic sets of strengths and weaknesses, can be genetically or socially linked. The two genders will always be different." She feels that these differences per se are very valuable contributions to the diversity and complementarity of ideas, methods of solving problems etc. "The challenges occur in situations when the inability to reach a mutually acceptable way to proceed on certain important issues and sometimes these can lead to loss of good opportunities that can be captured together."

Her secret mantra to success is a famous quote in Chinese, 心在哪里, 收获就在哪里. She translates it for us. "Translated literally means where your heart is, where the harvests will be. This means what you focus on and where you put in efforts, that's where you will reap returns."

Dr Siew Hwa ONG advises budding entrepreneurs to remain focused and patient in the pursuit of commercializing their business ideas.



**DR SIEW
HWA ONG**

Director & Chief Scientist at
Acumen Research Laboratories,
Singapore

AS CHAIRMAN OF
BIOSINGAPORE DR
SIEW HWA ONG
SUCCESSFULLY
CONTINUES TO
HANDLE ACTIVITIES
AND INITIATIVES
TAILORED
TO SOLVE
CHALLENGES
AND CAPTURE
OPPORTUNITIES



LINDA SEAH

VP & Head of South East
Asia Cluster,
Shire, Singapore

SUCCESSFUL
TRACK RECORD
IN CORPORATE
LEADERSHIP
SUPPORTED
LINDA SEAH
IN IMPROVING
COLLABORATION
BETWEEN
PHARMACISTS
ACROSS
DIFFERENT
HEALTHCARE
SECTORS IN
SINGAPORE

Improving collaboration between pharmacists

Linda Seah has over 20 years of successful track record in corporate leadership and general managerial roles in major pharmaceutical MNCs, namely GSK, Novartis, Baxter, and Baxalta. During her tenure as president of the Singapore Association of Pharmaceutical Industries (SAPI) (2014-2016), Linda played a key role in improving collaboration between pharmacists across different healthcare sectors in Singapore, leading to SAPI being awarded the 'Excellent Stakeholder and Partnership Award' by the Health Sciences Authority (regulatory body).

Currently working as VP & Head of South East Asia Cluster, Shire, Linda has been recently appointed by the Singapore Ministry of Health (MOH) to be a member of its International Healthcare Productivity Expert Advisory Panel. She has also been a Board Member of the Singapore Pharmacy Council, MOH for 12 consecutive years.

On challenges faced while climbing the corporate ladder in this male dominated industry, Linda said, "Even up to now, there is still the 'old boys club' and a glass ceiling. And on top of that, there is always an assumption that a woman is not mobile. Case in point, I refused to take up regional roles that involved frequent traveling in the first 15 years working of my pharma career to remain as General Manager in Singapore. It was clearly a concerted choice because I wanted to be there to raise my young children through primary school."

"Fundamentally, I believe that there is a stark difference between a young male executive versus a young female executive as they push themselves up the ranks. Assuming that they have

the same credentials, there isn't a level playing field for women, as society norms expect them to play different roles at home as a wife, a mother, a daughter. Today it takes a seasoned female leader to be able to lead by example and challenge the status quo but that usually comes after a woman has fulfilled the needs for her family first."

Speaking about the gender parity in the pharma industry in Singapore, Linda observed, "The healthcare industry tends to attract more females, unlike tech companies, so I think we should empower women in the organisation to contribute because they are born with different strengths. It also ties in well with our commitment to serve patients, it's in our DNA to care for other people."

For a women, priorities are many and varied opines Linda. "Our DNAs are different to begin with, so females tend to be more reserved, less outspoken and ultimately have more considerations when it comes to career change and progression. Women also go through different stages in their lives and their priorities need to be reshuffled when it comes to taking care of young children or aging parents, and we need to embrace them when they feel that it's the right time to return to the workforce."

On her success mantra, Linda said, "I think it boils down to how we measure our success – career success is certainly a way to tell how successful a man is, while a woman may measure her success by the well-being of her family (spouse, children, parents, community etc.). The corporate ladder has different connotations to different people, it's a very personal choice."

Improving financial performance



PATRICIA CHOU
CFO, Foresee Pharmaceuticals,
Taiwan

—

RECIPIENT OF
THE "2014 TOP
3 BEST CFO" IN
ASIA HEALTHCARE
INDUSTRY,
PATRICIA CHOU IS
LEADING THE IPO
PROCESS FOR THE
COMPANY

Patricia Chou has been serving as Chief Financial Officer in Foresee Pharmaceuticals Co., Ltd. a Taiwan based clinical stage pharmaceutical company developing and commercializing new drugs using its proprietary drug delivery technology, since March, 2016. The firm also develops first-in-class NCE in disease areas of high unmet medical needs. The company also recently bagged a deal with TRPharm, a leading Turkish biopharmaceutical company for the commercialization of Foresee's FP-001 program in Turkey and certain Middle East countries. Under the terms of this partnership, Foresee will receive a combination of milestones payments in addition to a significant share of the product revenue in the territory.

Prior to joining Foresee, Patricia, a Certified Public Accountant in Taiwan, the United States and China, served as the Chief Financial Officer, Vice President of Corporate Development, and Spokesperson of ScinoPharm Taiwan. She is also Director in Talentec International co., Ltd.

Patricia is also leading the IPO process at Foresee Pharmaceuticals. Under her leadership the company improved the financial performance, built a strong finance/investor relations/M&A team, and also implemented a number of industry best-practices in financial reporting, capital market fundraising, corporate governance, M&A, and strategic planning.

Speaking about challenges in the biotech industry, Patricia Chou, who holds a Master of Business Administration from University of California, Berkeley, a Master of Accounting from University of Southern California, and a Bachelor of Science in

Business Administration from National Taiwan University, said "Uncertainty and time pressure in this industry is more severe than in high-tech industries. Drug development is filled with uncertainties and the prolonged R&D phase and extremely high risks makes its finance super challenging."

Sharing her views on challenges Patricia observed that the prolonged R&D phase and extremely high risks of product development in pharma industry makes its finance super challenging.

Patricia was honored as the "2014 Top 3 Best CFO" in Asia healthcare industry voted by security analysts in Institutional Investor magazine. However, this journey up the ladder had its unique challenges for a women. "Balancing work and family, is largely a female's responsibility. If I were a male, who does not need to bear or breast feed babies, I might have done better than now, she added."

Talking about her achievements Patricia said, "As Foresee's CFO in the past 1.5 years, I've worked on raising more funds, building brand recognition in the local and global investment community, leading the upcoming IPO, and facilitating business growth."

Patricia says that compared to other industries that she has been associated with, biotech industry offers more opportunities for women and has more women employees on rolls. "In my experience of dealing with other industries, I feel the gender parity in pharma better as I can see more talented women in executive positions in the companies. But, the industry needs to be even more open, overlook gender and reward a person for their capabilities."



PEGGY WU

Regional director- Asia,
AbbVie, Singapore

PEGGY WU
HAS BUILT A
SUCCESSFUL
TEAM AND
ESTABLISHED
CULTURE IN A
COMPANY

Building a successful team

Peggy Wu, General Manager at AbbVie Taiwan was promoted to be Regional Director, Asia, managing eleven markets in the region a year ago. Based in Singapore, Peggy leads commercial and product strategy, marketing and sales in this area. Prior to joining AbbVie, Peggy worked with Abbott Taiwan in 2011 as General Manager.

Speaking about her current role and when she first started, Peggy Wu says, "As someone new in a role, my focus is always on how I can provide value and contribute over disrupting what's working well. So far it's been good. My takeaway since taking on this regional role from a single market position, is to be more patient with myself as more time is needed with greater complexity and different stakeholders."

Peggy opines that for a women to plan her career, many factors and family priorities need to be considered. "Generally men tend to plan their careers, assuming the family will go with it while women give more thought and preparation because of the impact on their families. I read in an article how some women find themselves compromising on their career or life choices simply because of the pressure to put family first as expected of them. That's sad."

Peggy started her career with Eli Lilly Taiwan, advancing to several management positions across different functions covering sales, marketing and HR. Peggy also held various leadership positions at Eli Lilly including an international marketing role based in Indianapolis. Peggy led the company's operations in Thailand and Vietnam as General Manager

before moving to Abbott. Peggy says that she did not face much challenges in her career in an industry where there are generally more men.

"Based on my experience, I haven't felt hampered being a woman in this industry. As an Asian woman however, the challenge lies in societal expectations of our role as the family's primary caregiver. So if you take the example of an overseas assignment involving a woman who's also a wife and mother, considerably more goes into the discussions and arrangements, within and outside the family."

Sharing her thoughts on gender parity in the industry which is improving with more women now assuming senior positions even in sales, Peggy says, "From my experience, there has been equal opportunities in the companies I work for. The greater proportion of men in science, I believe, goes back to the choice of study at the tertiary level. Naturally, this spills over to the professions they eventually choose to specialize. This proportion has also equalized over the years, from my observation. When I first started, there were more men in sales in this industry. Now there are more women with the percentage changing in our favour."

Peggy holds an MBA from National Cheng Chi University in Taiwan after earning a Bachelor's degree in Pharmacy and Nursing from Taipei Medical University. In her advice to budding women achievers, Peggy says, "Believe you can do it and set out to prove it. Follow your passion. Know your priorities and decide. There is no right or wrong or looking back."

Accelerating the transformation of innovations

Dr Sidney Yee is the CEO at Diagnostics Development (DxD) Hub and Executive Vice President at Exploit Technologies Pte Ltd (ETPL). A trained chemist and a research scholar, Dr Yee works with her team at DxD Hub to productise innovative diagnostic technologies and leads the A*Star's incubation and Start-up management team.

Not yet four years in the making, the DxD Hub aims to accelerate the transformation of innovations into clinically validated diagnostic devices that are ready for market adoption. The hub is already engaging with close to 100 partners in private and public sectors, and will soon be seeing real patient impact of their first few diagnostic solutions. Through impactful products, empowering local enterprises and anchoring global companies in Singapore, the DxD Hub contributes to the development of an effective diagnostic devices ecosystem in Singapore.

According to Dr Yee, the 'business plan' of DxD Hub was made possible only with the support, trust and collaboration of the A*STAR and ETPL leadership. She adds, "DxD Hub had proven to be such an aggregator of diagnostics community. The business model of committing to the risk-sharing and upside-sharing profile of building the diagnostics solutions to better lives resonated well with our partners."

On maintaining balance between her personal and professional life, she says, "Balance can only be done with a lot of understanding and support from family, as well as proper planning. When work needs to be done at home, it will only be done after family time. It is ok to have work and family time at home,

I make sure the boundary is drawn clearly. I try not to do both at the same time, but allocate time for each."

Dr Yee is also the executive vice-president of A*Star's incubation and start-up management division, A*START Central. However, Dr Yee is not a stranger to start-ups and have been a serial entrepreneur. Prior to joining ETPL, she has led and also been involved in fund-raising activities for biotech start-ups, which exited through initial public offering (IPO) and acquisition.

Talking about gender disparity in the industry, she says that while she has been fortunate enough to never have been subjected to gender biases in her career, she does believe that women often have self-imposed limitations while trying to balance career and family commitments and these can have consequences for professional development and progression.

"The challenge, if any, would be an inherent one because of the many facets of responsibility a woman bears as a mother, wife, daughter, sister and a professional," she adds.

She summons all entrepreneurs to be ready to evolve, be humble to learn, and be perseverant. She has special advice to women entrepreneurs. "Womanhood and career can co-exist and progress, learn to prioritise at different stages", she says.

Singapore's founding father Lee Kuan Yew, and her own father closer home, have both been her life's role models and a source of inspiration while trying to keep a positive attitude and in having the conviction and confidence to act in the face of challenges, adversity and criticism. An ability to make a real difference to people and society through her work is what truly motivates her.



DR SIDNEY YEE
CEO Diagnostics Development
Hub & Executive Vice President
ETPL, Singapore

A TRAINED CHEMIST AND RESEARCH SCHOLAR, DR SIDNEY YEE WORKS TO PRODUCTISE INNOVATIVE DIAGNOSTIC TECHNOLOGIES AND LEADS THE A*STAR'S INCUBATION AND START-UP MANAGEMENT TEAM



SUE MACLEMAN
CEO,
MTPConnect, Australia

SUE MACLEMAN DEVELOPED A 10-YEAR SECTOR COMPETITIVENESS PLAN (SCP) AND DEDICATED FUNDING POOL OF \$15.6 MILLION TO NURTURE NEW IDEAS AND GROWTH OF MTP SECTOR

Addressing skills gap in MTP sector

Sue MacLeman, who has more than 25 years' experience as an executive in medtech, biotech and pharmaceutical (MTP) sector with roles in corporate, medical, commercial and business development, was appointed as Chief Executive Officer of MTPConnect in 2016, one of the Government's Industry Growth Centres set up to develop a world-leading MTP sector in Australia. Under her leadership, MTPConnect has had an important impact on the sector, accelerating innovation and entrepreneurship, identifying and removing barriers to success to deliver sectoral competitiveness, collaboration and productivity.

In addition to her leadership roles, Sue is passionate about addressing the skills gap in the sector, upskilling the current workforce with the necessary business and commercialisation skills and creating pathways for students to easily transition from University to industry. Sue is a mentor in the Industry Mentoring Network in STEM (IMNIS), an industry-led mentoring initiative providing support and guidance to second-year PhD students looking to extend their professional networks.

Having worked at Schering-Plough Corporation (now Merck), Amgen and Bristol-Myers Squibb, Sue sits on the board of a number of public and private entities globally, including Oventus Medical Ltd, RHS Ltd and veski.

Speaking about challenges faced during her career, she observed "I have been very fortunate in my career journey to have had influential male and female mentors and advocates for me, both personally and professionally. I believe Australia's MTP sector is supportive of women. However, we need more focus and support to ensure diversity on our boards and in our senior management

teams. Women need to embrace the opportunities and be prepared to showcase their skill and expertise, and have a clear value proposition as to why they should be selected for that senior role or Board position. Men must continue to champion this change and call out discrimination in any form when they see it."

Commenting on gender parity in the pharma industry, Sue mentions "I am a strong advocate for gender parity in the MTP sector and in particular, I believe that having diversity in leadership is critical to driving innovation and collaboration within the sector. Innovation is critical to any industry and it requires a diversity of perspectives and collaborative approaches. Australia must embrace a more inclusive approach to leadership – particularly in the MTP sector – to be in the strongest position to compete globally, innovate and grow. Explaining her early days with MTPConnect Sue says, "Following the release of the National Innovation and Science Agenda in December 2015, I was excited to rise to the challenge of leading the new Industry Growth Centre, MTPConnect. As a not-for-profit organisation, distinct from government, I saw it was an opportunity to act as independent voice for Australia's MTP sector; representing the needs and interests of the entire MTP sector, and acting as a champion for change at the highest-level. Today, I am thrilled with the support that MTPConnect has received from the sector and the influence we have had within government."

Sue has risen to the challenge of leading the new Industry Growth Centre, MTPConnect, and has shown outstanding leadership in her ability to unify key sector stakeholders around a shared vision for the future of MTP industry.

Engaging team in delivering growth

With more than 15 years of management and business development experience in the private health sector, Teena Pisarev has a broad understanding of the emerging trends and challenges facing the health industry. Because of Teena's ability to engage a team and deliver growth, the Icon Group appointed her to lead its first foray into international healthcare as CEO of Icon SOC in Singapore. Her leadership style is simple – happy, engaged clinicians and team result in exceptional patient care. Before that, Teena was CEO of Icon Cancer Care in Australia.

At Icon Cancer Care, she oversaw divisional expansion via engagement with VMOs, staff and partner organizations. Through the simplification of processes, strengthening of clinical governance and empowerment of local leaders, Teena delivered strong growth in activity and EBITDA. The 2015-2016 financial year saw record numbers of patients treated across the network, with many locations posting higher activity than ever before.

Speaking on gender parity in the industry, Teena says, "I am extremely lucky I have not, for a very long time, experienced any gender issues in my workplace. In fact, my story almost goes against the trend as I was offered my first CEO role whilst returning from maternity leave with Icon Group. I also believe you must vote with your feet and work for companies who address the issues and allow gender diversity and equality to flourish. Gender parity needs to be addressed. The facts and figures are in and show that companies who have progressive

approaches to these issues do much better than those who don't in nearly every facet of their operations. It makes sense and is happening globally."

In her advice to women scientists and entrepreneurs, Teena urges them to accept the challenge and, 'go for it!' "The traditional roles of men and women still often impact the thinking of many women across the globe. As a mum of two great kids (3 and 14), happily married for 16 years and having the job of my dreams – you can have it all, but it is hard and sometimes you need to make sacrifices. Plan your next steps and tell people where you want to go to ensure assumptions about your career are not made for you. People are important to your journey! What I mean by that is, no matter what role you have, how you treat, communicate and engage people will determine your success".

Teena loves Asian food and said that her favorite holiday destination is Bora Bora, where her husband took her on their 10th wedding anniversary. Over her career, Teena has recruited and established practices for new doctors, led major brownfield healthcare redevelopments, and implemented new services to significantly increase visiting specialists and patient numbers. However, climbing up the corporate ladder in this male dominated industry wasn't easy. Teena says, "Unconscious bias is real and even for the most supportive environments this can pop up from time to time. I have learnt to recognize it and wherever I can, I try to address it."



TEENA PISAREV

Chief Executive Officer,
Icon SOC, Singapore

UNDERSTANDING
THE EMERGING
TRENDS AND
CHALLENGES
FACING THE
HEALTH INDUSTRY
TEENA PISAREV
HEADING
THE TEAM IN
EXCEPTIONAL
PATIENT CARE



SANDHYA NARGUND

Senior Manager, Shimadzu,
APAC, Singapore

ACHIEVING 'BEST
SALES IN MASS
SPECTROMETRY'
FOR 3 TIMES;
SANDHYA HAS
BEEN ARRANGING
PRODUCT
LAUNCHES AND
PROVIDING
TECHNICAL
SUPPORT TO
SALES TEAM IN
REGION

Believing in positive attitude

Based in Singapore, Sandhya Nargund is currently the Senior Manager for Shimadzu APAC. Prior to joining Shimadzu, Sandhya worked in Harman Finotech Ltd, a leading API industry in India. Sandhya has nearly 20+ years extensive experience in the pharmaceutical industry spanning across various departments of Quality Control, Quality Assurance, R&D, Validations and USFDA audits. Under her leadership, Shimadzu has received 'Frost & Sullivan Mass Spectrometry company of year' award for three consecutive years.

In her current role, Sandhya is responsible for promoting Mass Spectrometry and Chromatography products in South East Asia, South Asia and India, arranging product launches and providing technical support to Sales team in region.

Speaking about her early days with Shimadzu, Sandhya, said, "My career journey is very unusual and interesting, with many unexpected changes. I changed from a routine pharma chemist to marketing manager of a global vendor company so obviously there is lot of learning involved at every turn. It was risk to change the job scope which is totally different. However, every time the change was for better and scope of job only got widened. The most enjoyable journey was in my current job from product specialist to Senior Manager in just 7 years."

Sandhya joined Shimadzu in year 2010 as 'Product Specialist for MS' and the role involved technical marketing of Mass Spectrometry products in South East Asia, South Asia and India. "This was totally new role and involved lot of new responsibilities,"

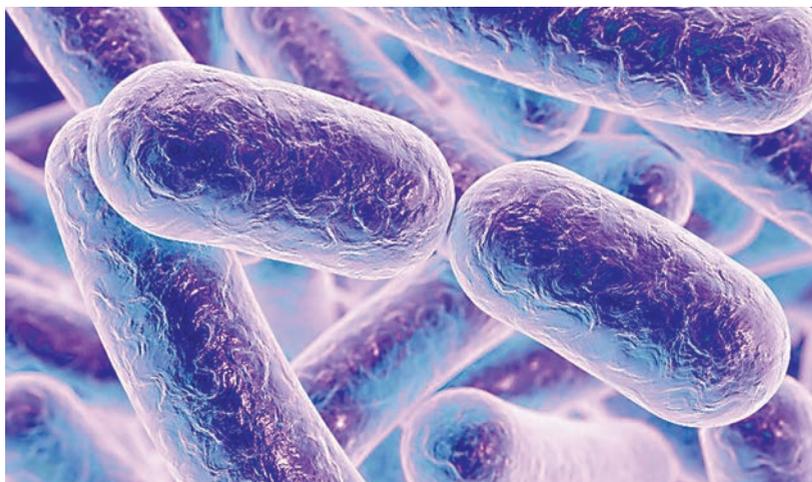
says Sandhya. "It was a new challenge to successfully launch the new Triple quadrupole Mass Spectrometer in the market where the competition was very strong."

Sharing her thoughts on gender parity in the industry, Sandhya says nowadays gender parity has improved a lot. "I agree that pharma is still a male dominated industry but the number of women leaders is definitely increasing."

When asked about challenges Sandhya said, "The major challenge was to prove your competency and do not make big issue of 'being women'. Many times, I am a single woman in group of 20-25 men but making yourself comfortable in such environment is a challenge in the beginning. The support from family is very crucial especially from 'men' in family but I am fortunate to have very supportive family and probably that is the key reason I had less challenges. Apart from that, I don't believe 'being women' can stop you from the success."

Sandhya believes that positive attitude, passion and patience are the pre requisites for success. She adds that though the industry is accepting more women leaders, number of women on higher positions is way below men.

She observed, "It is still a fact that, although women are now focusing more in career but the number of women on higher positions is way below men. I think, taking decision and be ready for the consequences is important to achieve higher positions. Many of women hesitate to take decision due to fear of being 'wrong' or fear of 'making mistake' but unless you take this risk, it is not possible to climb up in position."



Japanese researchers devise a method for developing living antibiotic

A group of researchers at the Okinawa Institute of Science and Technology (OIST) in Japan have discovered a method to manipulate the predatory behavior of bacteria, which may help tackle the problem of antibiotic resistant microbes. The researchers were able to manipulate the predatory life cycle of *Bdellovibrio bacteriovorus* by using a chemical theophylline. *B. bacteriovorus* is not a known pathogen to humans. It is a known pathogen to Gram-negative bacteria including disease-causing pathogens such as *Escherichia coli*, *Salmonella*, *Legionella*, making it a possible biocontrol agent to many human pathogens.

The researchers used riboswitches, which are gene expression-controlling tools known to function well in other bacteria, to tackle the challenge of understanding and manipulating *B. bacteriovorus* predation. The researchers believe that the predatory bacteria may be a potentially safe alternative to antibacterial agents for some plant diseases. It can also be used for water treatment plants. In the future, one could also spray these bacteria on fresh food to protect against food poisoning.

Korean scientists invent hydrogel to combat rheumatoid arthritis

Scientists at the Institute for Basic Science in South Korea have invented a hydrogel to fight rheumatoid arthritis and other diseases. This jelly-like material can be used to absorb extra fluids in swelling joints and release drugs.

Immune cells at the inflamed joints are the predominant source of nitric oxide, a gas with various physiological functions. Nitric oxide regulates inflammation and protects our body by killing external pathogens. However,

when in excess, it is toxic and may cause rheumatoid arthritis and other autoimmune diseases.

The research team developed a gel using acrylamide as a base material and a new cross linker to keep it in place. The cross-linking agent forms bridges between the acrylamide molecules creating a net, which can trap drug molecules inside. When Nitric Oxide cleaves the bridges, the gel changes its structure, frees the drug and absorbs new liquid.

Scientists in China design health gadgets

A group of scientists from the Chinese Academy of Sciences have developed a magical suit fitted with large-area textile sensors which can detect temperature, pH levels, pressure and other indicators that show the health status of a person. With the help of wireless transmission, those signals can be sent to a cellphone, a computer, or even to a doctor thousand miles away, so a person's health can be monitored anytime and anywhere. The group has also been working on nano tattoos and a self-charging cardiac pacemaker, which does not need recharging or replacement. The nano tattoos are stickers which can be worn on the arm to administer drugs into a patient's veins, providing a painless way of injection for diabetics. These gadgets are expected to hit the market in two to three years. These high-tech gadgets are based on the principle of triboelectric nanogenerator. It harvests mechanical energy of motion, such as the energy people produce when they walk, and transforms it into electric signals.



Researchers in Japan detect bowel cancer using AI

According to researchers from the Showa University in Japan, a powerful artificial intelligence (AI)-powered system can detect bowel cancer in less than a second. The system can be used to detect the type of bowel cancer that develops from colorectal adenomas. It has been trained using over 30,000 enlarged endoscopic images.

The research team claims, that after analysing 250 patients and 300 colorectal adenomas, the AI was able to guess, with a 94 per cent accuracy, the malignancy of tumours in under a second. The most remarkable breakthrough with this system is that AI enables real-time optical biopsy of colorectal polyps during colonoscopy, regardless of the endoscopists' skill.

The team is now undertaking a multi-centre study for this purpose and is also working on developing an automatic polyp detection system. However, this method to spot tumours is yet to receive regulatory approval, but the researchers believe that it could prevent needless surgery for several patients.



SNU researchers develop blood test technique for Alzheimer

A group of researchers at the Seoul National University (SNU) in South Korea have developed a new technique for a series of blood tests designed to predict Alzheimer's disease before the symptoms start to appear. It is believed that the disease occurs due to the build-up of a beta-amyloid protein that is considered toxic to the neurons. The existing techniques for the detection of amyloid plaques include positron emission tomography (PET) scans that are reported to be expensive and distressing to a patient.

The new technology has been designed to predict the amyloid PET test result with 90 per cent accuracy, and requires only a small blood sample. The technology is expected to enable cost reduction, while its ability to allow early screening and prediction could potentially prevent the disease. The technology uses a combination of protease inhibitors and phosphatase inhibitors (MPP) to stabilise beta-amyloid levels in the blood for obtaining accurate results. The university has licensed the technology to biotech firm Medifron DBT and intends to co-develop diagnostics kit and computing algorithm required to commercialise the technology.

Scientific experts in Bangladesh invent convenient cancer detection test

A group of Bangladeshi scientists at the University of Wollongong (UOW) and Griffith University in Australia has developed a new class of nanomaterials that can detect cancer earlier in a cheaper way.

The newly developed class of enzyme-like nanovehicles can be used as an inexpensive, non-invasive diagnostic tool to detect cancer. It uses gold-loaded nanoporous iron oxide nanocubes for sensing body fluid. It can be used as an inexpensive, non-invasive diagnostic tool to detect cancer.



The system relies less on laboratory equipment and can deliver sensitive and specific results that can be

easily and quickly interpreted. The two-step diagnostic method uses the gold-loaded nanoporous iron oxide nanocubes for magnetically isolating the cancer biomarkers, proteins, DNA or RNA in serum and tissue samples collected from cancer patients.

Given that the diagnostic tool has potential applications around the world, the group is now looking for industry partners to collaborate on the project. The scientists aim to develop a portable diagnostic device for less than \$5.

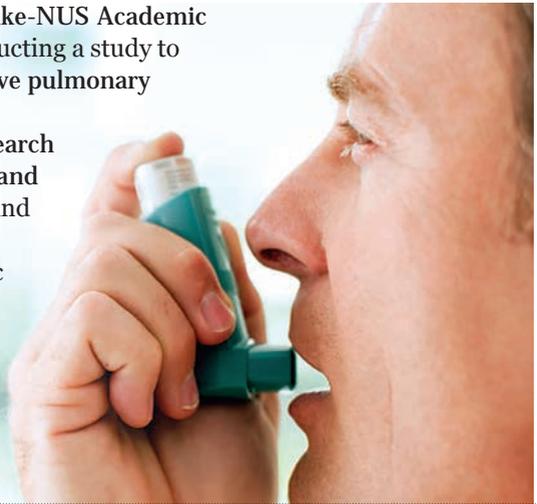
Singapore conducts research on asthma and COPD

A team of clinicians and researchers from the SingHealth Duke-NUS Academic Medical Centre (AMC) and pharmaceutical firm GSK are conducting a study to improve the care of Singapore's asthma and chronic obstructive pulmonary disease (COPD) patients.

The \$1.2 million study aims to create a database for research into respiratory diseases by accelerating the digitisation and integration of records of patients who suffer from asthma and COPD - a serious disease that limits airflow to the lungs.

The researchers will be using the data to create electronic dashboards to track the management of patients with asthma and COPD, such as the risk of hospital readmission and treatment plans, for healthcare institutions to use.

The dashboards will enable healthcare professionals to predict the outcomes and risks of the two diseases, and hence improve intervention and patient education.



Otago University teams up with Chinese institutes

The University of Otago in New Zealand has teamed up with three leading Chinese health institutions to combat the growth in diseases such as Alzheimer's and heart disease.

The university has signed a Memorandum of Understanding (MoU) with representatives from Huashan Hospital, Shanghai Mental Health Centre and the Fudan University of Public Health to foster co-operation in research of non-communicable diseases (NCD).

The objective of this collaboration is to give New Zealand close links with the latest medical developments. This association will allow to match up New Zealand NCD research know-how with breakthrough Chinese techniques, their outstanding facilities, and wealth of big data research opportunities that China's vast nation avails. At present, non-communicable diseases are poised to take a growing toll of premature death and ill health in both countries.



McGill signs research agreement with Japan's NIPS

McGill has entered into a formal partnership with Japan's National Institutes of Physiological Sciences (NIPS) after signing of a Memorandum of Understanding (MOU). This arrangement marks McGill's first such agreement with an Asian partner and the first MoU signed by NIPS with a North American institute. NIPS is an inter-university national research institute based in Okazaki, Japan. It is a leading research institute for understanding human physiology with a strong emphasis on neuroscience research. The objective of this MoU is to further strengthen the world-class neuroscience research being done at both institutes. At the core of the partnership will be collaborative exchange, training opportunities, and bi-directional access to key infrastructure and expertise to promote cutting-edge neuroscience research. Research at NIPS will complement the advanced neuroscience research being done at McGill within areas of cellular and molecular neuroscience, neurodevelopment, cognitive neuroscience and brain imaging.

SUPPLIER NEWS

GenePOC introduces new molecular diagnostic test

GenePOC, a Canada based diagnostic devices maker, has introduced its GenePOC Group B Streptococcus (GBS) Direct Swab (DS) molecular test in Europe to reduce the risk of transmission from mother to newborn.

The test has been designed as a sensitive and accurate qualitative in-vitro diagnostic method to identify GBS from direct vaginal or rectal swab samples at intrapartum.

The point-of-care test will provide a precise assessment of the GBS colonisation status of the mother at the time of delivery, allowing better control of transmission risk, as well as lowering mortality and morbidity.

The company aims at working closely with the distribution partners to improve the standard of care while decreasing the occurrence of early onset Group B Streptococcal disease in infants.



Thermo Fisher signs agreement with Blueprint Medicines

Thermo Fisher Scientific has expanded the development of its Oncomine Dx Target Test by entering into an agreement with Blueprint Medicines Corporation to develop and commercialize the Oncomine Dx Target Test as a companion diagnostic (CDx) for BLU-667 to identify RET fusions in people with non-small cell lung cancer (NSCLC).

This step has been taken as part of its ongoing commitment to increase the utility of next-generation sequencing (NGS) in the clinic. BLU-667 is a potent and selective inhibitor of the kinase RET, including RET fusions and mutations, currently being evaluated by Blueprint Medicines in a Phase 1 clinical trial for the treatment of patients with RET-driven NSCLC, thyroid cancer and other advanced solid tumors.

Once validation is complete, Thermo Fisher will submit a supplemental premarket approval application to the U.S. Food and Drug Administration (FDA) to expand the clinical claims for its Oncomine Dx Target Test. Under the terms of the agreement, Thermo Fisher will also retain the rights to commercialize the test globally and will lead all necessary filings to seek clearance from regional regulatory agencies for the test.

Avantor opens applications laboratory in South Korea

Avantor has recently opened a new life sciences research and applications laboratory in the GwangGyo district, Suwon, South Korea. Avantor is a global supplier of ultra-high purity materials for customers across the life sciences and advanced technologies sectors. The new laboratory aims at helping biopharmaceutical and pharmaceutical customers improve the efficiency of their purification processes. The main focus will be on helping them optimize

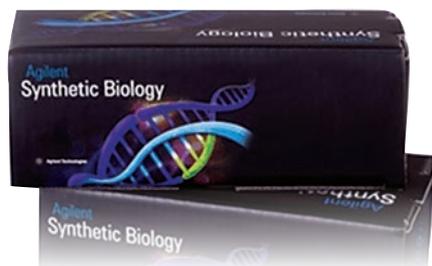
Avantor's high-performance resins, buffers and other materials used in their production systems.

State-of-the-art life sciences research tools, expert scientists, application specialists and resources and accommodations will be a part of this specialized laboratory. There will be provision of on-site training for topics such as biopharmaceutical drug development, process validation and regulatory compliance.



Agilent Technologies launches SureGuide CRISPR libraries

Agilent Technologies has announced the launch of new SureGuide pooled libraries for CRISPR activation and interference. The latest additions to the company's range of pooled SureGuide CRISPR libraries for functional genomics will be created using Agilent's advanced SurePrint DNA synthesis platform, with billions of DNA bases printed with fidelity and superior representation. The libraries will be offered in both Ready-to-Clone and Ready-to-Amplify formats, with the former allowing users to specify the sequence of each guide or choose from predefined subsets, and the latter letting them fully design every aspect of the library. Whereas CRISPR knock-outs target individual genetic regions, CRISPR activation and interference libraries target transcription start sites throughout the genome, allowing researchers to modulate the expression of individual genes and screen the resulting phenotypes.



Odelga invests to improve Sri Lanka's healthcare system

Austria based supplier of healthcare products and services, Odelga MED will be investing nearly 9.6 million euros to improve the health facilities in Sri Lanka. The company will be working towards developing Intensive Care units (ICUs) and operating theatres in 33 state hospitals countrywide.

Odelga MED and the Ministry of Health and Nutrition and Indigenous Medicine signed the Supply Contract recently for the supply of 'State of the Art Medical Equipment for the Upgrading of Operating

Theatres and Intensive Care Units'. Health Ministry Secretary Janaka Sugathadasa and Odelga MED Managing Director Peter Haag have taken the lead in this regard. Health Minister Rajitha Senararatne pointed out that a lot of foreign investments have been received to develop hospitals in Sri Lanka.

This is the highest sum of foreign aid the health sector received so far. The Government has taken steps to practically provide health services without limiting free health services into name boards.

Shimadzu enters into partnership with Cure & CK Sciences

Shimadzu, an analytical instrument manufacturer, has announced the formation of a partnership with Cure Pharmaceutical Group and CK Sciences to research and develop pharmaceutical cannabis-based products. The three organizations entered a collaborative agreement with the goal of researching and developing products, then moving them through clinical trials using FDA guidelines.

The primary goal of this partnership will be researching and profiling the synergistic effects of the cannabinoids and terpenes, called the Entourage Effect.

Shimadzu has worked extensively with

cannabis laboratories throughout the country in refining methods and improving analytical chemistry in the space. Shimadzu powers EVIO Labs Florida with over \$1.2 million in the latest testing instrumentation.

Shimadzu has launched their Cannabis Analyzer for Potency, a high-performance liquid chromatograph (HPLC) designed specifically for quantitative determination of cannabinoid content. The organizations in the partnership will be using that instrument, in addition to a headspace Gas Chromatograph Mass Spectrometer (GCMS) for terpene profiling.





UNIST Professor receives Young Investigator award

Professor Chunghun Lim in the School of Life Sciences at the Ulsan National Institute of Science and Technology (UNIST), South Korea has received the 2017 SUHF Young Investigator award by Suh Kyungbae Foundation (SKF). The Suh Kyungbae Science Foundation selects three to five Korean scientists through an open recruiting process and grant a maximum of 2.5 billion KRW over a period of up to five years. Professor Lim has received this honour in recognition of his passion and commitment to scholarly research. During his PhD in Biological Sciences program at the Korea Advanced Institute of Science and Technology (KAIST), he was involved in the study of viruses. The research theme chosen by the foundation is based on new principles of genetic decryption. Through this project, Professor Lim and his research team will be working on the study of the fundamental working principle of nonstandard protein translation.

ImmunoMet appoints Benjamin R. Cowen as CEO

ImmunoMet Therapeutics, a spin-off of HanAll, a Korean biopharma company, has appointed Benjamin R. Cowen, PhD, MBA, as Chief Executive Officer. Dr Cowen previously held the position of Chief Operating Officer. Sung-Wuk Kim, DDS, Founder and outgoing CEO, will continue to serve as Chairman of the Board of Directors.

Dr Cowen has 20 years' experience working with private, early-stage biotechnology companies and public companies, including Shire and Merck, where he held various senior management positions and received recognition for leading high-performance teams and successfully completing key business development transactions. Prior to joining ImmunoMet, Dr Cowen served as VP of Corporate Development at Milestone Pharmaceuticals, where he played a key role in a Series B financing and was responsible for business development and commercial activities.

Dr Cowen also serves on Atrin Pharmaceuticals' Board of Directors since its inception in 2012. Dr Cowen received his PhD from the University of Illinois at Urbana Champaign, MBA from Carnegie Mellon University, BA at Brandeis University and was an NIH Post-Doctoral Fellow at the University of Pennsylvania. He joined ImmunoMet as COO on November 1, 2016.



Median Technologies announces new appointments

Median Technologies, The Imaging Phenomics Company recently announced the appointment of Vivian Wang as General Manager, China and the appointment of Takashi Hayashi as Managing Director, Japan.

As General Manager of China, Ms Wang is responsible for scaling Median's operations and commercial teams. As the General Manager, she will ensure the execution of the strategic plan across Greater China and the delivery of key company and customer milestones. Vivian previously worked at Philips Healthcare where she spent a significant part of her career as the Business Leader for healthcare informatics. Vivian used her experience to understand the software and healthcare markets in China, the Ministry of Health and the regulatory pathways for

new product development as well as building a strong network of Key Opinion Leaders. Vivian graduated from the Guanghua School of Management, Peking University.

As Managing Director, Japan, Takashi Hayashi is responsible for the development and scaling of Median's business in Japan. Mr. Hayashi has nearly 30 years of professional experience in the pharmaceutical industry, where he was at a Contract Research Organization (CRO). He has over 13 years of research and business experiences in clinical trials related to pharma/biotech products and health/functional foods. Takashi holds a Bachelor of Science in Life Science from the Tokyo College of Medico-Pharmaco Technology (Japan) and Pacific Western University (off-campus, Hawaii).



Lighting Lamp-(L-R) Sudhanshu Pandey-Joint Secretary -DoC, Ministry of Commerce & Industry, Gol, Rita Teatia, Secretary, Dept. of Commerce, Ministry of Commerce & Industry, Gol, Dr Shalini Rajneesh, Principal Secretary-Health & Family Welfare, Govt. of Karnataka, Sangeeta Godbole, Director General – SEPC, Satyajeeet Rajan – Director General, Ministry of Tourism, Gol.

Advantage Healthcare India 2017

Attracts 700 buyers from across the world

The three day Advantage Healthcare India 2017, the third global summit on medical value travel (medical tourism) jointly organized in Bangalore from October 12 by Federation of Indian Chamber of Commerce & Industry (FICCI); Department of Commerce, Ministry of Commerce & Industry, Government of India; and Service Export Promotion Council (SEPC), witnessed participation of over 70 countries and 700 hosted buyers from across the world along with thousands of business visitors from India and abroad.

In her inaugural address, Rita Teatia, Secretary, Department of Commerce, Ministry of Commerce and Industry, Government of India said, “Medical value travel is a win-win for patients and providers – it creates jobs and encourages interchange of cultures across borders while fulfilling healthcare needs of people. As the focus on medical tourism shifts to Asia, India has emerged as one of the fastest growing

markets. The size of the Indian medical value travel industry is currently \$ 3 billion, but the scale of the entire Indian healthcare industry is \$ 110 billion.”

She further said “This is a huge base which can support quality and affordability of our medical tourism proposition. The depth of the Indian healthcare sector is unique. Its USP in medical value tourism has three elements: quality, affordability and scale. AYUSH also sets us apart from other medical tourism destinations. We are now focusing on the global acceptance of Ayurveda on the lines of Chinese medicine. Dental treatment and medical research are other areas with enormous potential.”

Addressing the gathering Dr Shalini Rajneesh, Principal Secretary, Health & Family Welfare, Government of Karnataka said: “In Karnataka, we have the best of natural ambience for good health and it can cure worst of illnesses. The Government of Karnataka is the first in the country to bring out an



Rita Teaoitia, Secretary, Dept. of Commerce, Ministry of Commerce & Industry, Gol addressing the conference

integrated health policy, trying to integrate allopathy with AYUSH. Karnataka is well positioned to benefit from the medical value travel opportunity. It has 26,000 modern clinics and hospitals in the private sector, in addition to 40,000 AYUSH practitioners.”

Dr Shalini Rajneesh further said “We also have 30,000 traditional healers who, though not well known globally, have as many foreign clients as Indian ones! They have effectively provided healing to thousands of people worldwide which has been effective in cases where allopathy has no answer. On an average, one-third of the income of a person anywhere in the world gets spent on healthcare, which offers a huge opportunity for the Indian medical tourism sector. The challenge is how best we can offer health and wellness as a package to the best satisfaction of clients.”

Dignitaries present during the launch included Sudhanshu Pandey (Jt. Secretary), Department of Commerce, Ministry of Commerce & Industry, Government of India; Gaurav Gupta, Principal Secretary, Department of IT, Biotechnology & Tourism, Government of Karnataka; Satyajeet Rajan, Director General, Ministry of Tourism, Government of India; Sangeeta Godbole, Director General, SEPC; and Bhavdeep Singh, Chair – FICCI Medical Value Travel Committee and CEO, Fortis Healthcare.

Several panel discussions were held at the summit, with more than 40 speakers sharing their views on themes like AYUSH: The Indian System of Medicine for Healing and Rejuvenation; Clinical Excellence in Medical Care: Destination India; Leveraging Technology for Diagnosis, Treatment & Aftercare; Health Insurance – A Key Enabler for high-end Tertiary

“INDIA TO INTRODUCE MEDICAL & WELLNESS TOURISM POLICY NEXT YEAR”

Congratulating the Karnataka Government for its medical and wellness tourism policy, Satyajeet Rajan, Director General, Ministry of Tourism, Government of India, said “we will work on developing a medical & wellness tourism policy at the centre by taking inputs from Karnataka policy. We will also bring out a similar policy at the Central Government level next year.”

Speaking at the three day Advantage Healthcare India 2017 held in Bangalore in October, the third global summit on medical value travel (medical tourism) held in Bangalore he said “Some interventions by the Ministry of Tourism to facilitate medical value travel to India have been path breaking, such as the introduction of e-medical visas ranging from 60 days to 6 months and doing away with the requirement for foreign patients to report to FRROs.”

Elaborating on the plans of tourism ministry, he said “We are going to set up six facilitation enters in Bengaluru, Chennai, Hyderabad, Kolkata, Delhi, and Goa by January next year to cater to medical tourists. We are also focusing on promoting homestays for medical tourists to bring down their cost of stay in India.”

Care; and Karnataka: An Emerging Destination for Medical Value Travel.

The three-day event was meant to promote India as a premier global healthcare destination and enable streamlined exports of healthcare services. More than 160 exhibitors showcased medical services and expertise at the exhibition. Thousands of reverse buyer-seller meetings were held offering opportunities for tie-ups with Indian hospitals and healthcare centers for medical tourism. In addition, the event was projected as India’s medical devices sector to encourage foreign companies to start manufacturing locally.

A key highlight of the event was Medical Value Travel Awards 2017 which recognizes and showcase innovations that have helped promote India as a premier medical travel destination.

Participants at Advantage Healthcare India 2017 include international hospitals, government organizations, insurance firms, medical tourism organizations, global medical associations, medical journalists, doctors, and investors.

Supporting partners of the event include EEPC India and Pharmaceuticals Export Promotion Council of India (Pharmexcil).

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